

Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

## SECTOR 1 — CHART INFORMATION

# SECTOR 1

## BAY OF FUNDY AND SOUTHWEST COAST OF NOVA SCOTIA

**Plan.**—This sector first describes the NW shore of the Bay of Fundy, from Grand Manan Island to Cumberland Basin. The arrangement of this first part is from SW to NE.

The SW coast of Nova Scotia, from Cape Sable, the SW extremity of Nova Scotia to **Brier Island** (44°15'N., 66°22'W.), then the SE shore of the Bay of Fundy to Minas Basin is then described. The arrangement of this part is from the SE to NW, then to the NE.

**Note.**—See paragraphs 3.46 and 3.47 for description of the Nova Scotia Banks.

### General Remarks

**1.1** The Bay of Fundy, a NE extension of the Gulf of Maine, separates the peninsula of Nova Scotia from the Province of New Brunswick. It has a general width of 30 miles and a length of 90 miles from Grand Manan Island at its entrance to Cape Chignecto near its head. At Cape Chignecto it divides into two branches, Chignecto Channel on the N and Minas Basin on the S.

Grand Manan Island, with its associated islets and dangers, divides the entrance into two passages. The W passage, Grand Manan Channel, is about 5.5 miles wide and free from dangers. The E passage is much wider, but is bordered on each side by off-lying rocks and shoals. Navigation in the Bay of Fundy requires constant attention due to the rapid and uncertain tidal currents, the prevalence of fogs, and the difficulty of obtaining anchorage due to the depth of water. Vessels bound for ports on the NW side of the bay may wish to use Grand Manan Channel in preference to the SE channel, as the Maine coast is often quite clear when the coast of Nova Scotia and most of the bay is enveloped in fog.

**Winds—Weather.**—In consequence of the frequency with which depressions pass near to or across Nova Scotia, winds are very variable. In the Bay of Fundy, winds tend to blow along the central axis of the bay. Except in Minas Bay, S to SW winds in summer and N to NW winds in winter are more prevalent than in the open sea SE of Nova Scotia.

**Tides—Currents.**—The tides of the Bay of Fundy, which are the greatest known, are very regular and the tidal currents are not easily disturbed by wind. The tidal differences are thus very constant for each locality from Yarmouth to the head of the bay. The average spring range of tide in the upper parts of Chignecto Bay and Minas Channel are about 11.3m, as compared to about 3m in the Gulf of Maine. In the vicinity of Burntcoat Head, at the head of Minas Basin, the tide rises 14.3m at neaps to 16.6m at spring tides.

Tidal currents to a distance of 12 miles from Cape Sable were found to be somewhat regular during a survey in the summer season; however, it was reported that on **Browns Bank** (42°29'N., 66°13'W.) the current occasionally sets to the NE continuously for 15 hours at a velocity of 2 knots. Therefore, when crossing this area, mariners should exercise extreme caution, particularly during reduced visibility.

The currents in the Bay of Fundy are predominantly tidal in character, with the flood current running strongly to the N and NE and the ebb current to the S and SW; any set in a cross direction occurs only when the current is weak. Offshore, the current turns in a clockwise direction at SW and does not reverse its direction as quickly as it does nearer the shore.

**Traffic Separation Scheme.**—For vessels entering or departing from the Bay of Fundy to the SE of Grand Manan Island, there is a compulsory separation scheme about 20 miles SE of Southwest Head.

**Vessel Traffic Management Services.**—A VTS center at Saint John, New Brunswick (call sign Fundy Traffic) administers a system for the Bay of Fundy, including Saint John Harbor. The system features radar, VHF radio, and VHF D/F monitoring.

Participation is mandatory, as follows:

1. All vessels of 20m or more in length.
2. Vessels engaged in towing or pushing where the combined length of the ship and any vessel or object towed or pushed by the ship is 45m or more in length.
3. Vessels engaged in towing or pushing where the length of the vessel or object being towed or pushed by the ship is 20m or more in length.
4. Air cushion vehicles of 8m or more in length.

A traffic clearance is required before entering a zone or departing a berth or mooring. Clearance is obtained by making reports 15 minutes before entering the zone, arriving at a calling in point, arriving at a berth and departing a berth.

The VTS Center, call sign "Fundy Traffic," can be contacted, as follows:

1. Sector 1—VHF channel 14.
2. Sector 2—VHF channel 12.
3. Sector 3—VHF channel 71

### Grand Manan Island

**1.2** Grand Manan Island, a part of the Province of New Brunswick, is thickly wooded and about 122m high near its N end. **Northern Head** (44°48'N., 66°47'W.), the N extremity of the island, lies about 7 miles E of West Quoddy Head, Maine. The W coast of the island is steep-to, with cliffs rising from 61m near Southwest Head, its S extremity, to nearly 122m near Northern Head. The E and S sides have several harbors and anchorages, but their approach is made difficult by numerous islets, rocks, and shoals extending about 8 miles SE and 10.5 miles SW of the island.

Local magnetic anomalies exist in two areas S of Grand Manan Island located about 4.8 miles S and 6.5 miles ESE, respectively, of Southwest Head. It has been reported that compass deflections of up to 45° have been observed in the latter area.



**Machias Seal Island Light**

### Off-lying Banks, Islets, and Dangers

**1.3** Grand Manan Banks consist of two rocky banks, Northeast Bank and Southwest Bank, located about 20 and 30 miles SSW, respectively, of Grand Manan Island. Northeast Bank has a least depth of 35m, while Southwest Bank has a least depth of 53m.

**Tides—Currents.**—The flood current sets NNE and the ebb current SSW over Grand Manan Banks, with a velocity of about 1.5 knots causing an extensive tide rip.

**Caution.**—A whale sanctuary, active annually from July to November, for right whales, which are an endangered species, exists in Grand Manan Basin within the following coordinates:.

- a. 44° 45'N, 66° 35'W
- b. 44° 45'N, 66° 18'W
- c. 44° 30'N, 66° 18'W
- d. 44° 30'N, 66° 35'W.

A large part of this area is in the Bay of Fundy Traffic Separation Scheme and consequently may be difficult to avoid. Mariners are advised to avoid passage through this area. If this is not possible, then decrease speed, post lookouts, and maneuver around any marine mammal activity. Further information can be found in Pub. 140, Sailing Directions (Planning Guide) North Atlantic Ocean, Baltic Sea, North Sea, and the Mediterranean Sea.

**1.4 Machias Seal Island** (44°30'N., 67°06'W.), 8.5m high and steep to on its W side, lies about 10 miles SW of Southwest Head. Machias Seal Island Light is shown from a white octagonal concrete tower with a red top, 18.3m high, on

the summit of the island. A fog signal of two blasts every minute is sounded. A drying reef, with an islet near the outer end, extends about 0.4 mile NE of the islet. A 4.3m patch over which there is a tide rip, a 6.1m shoal, and a 9.1m patch, lie about 0.4 mile ESE, 0.7 mile E and 1.3 miles ENE, respectively, of the light.

**Note.**—Machias Seal Island is a designated Migratory Bird Sanctuary administered by the Government of Canada. Landing to observe the wildlife is only possible on the E side of the island by a small boat in ideal wind and sea conditions. Such visits are controlled by the Sanctuary Warden and visitors must comply with specified regulations.

Southeast Shoal, with a least depth of 2.7m, about 1 mile SE of Machias Seal Island, breaks in heavy weather and shows tide rips extending 1 mile N and S of the shoal during the strength of the tide. The tidal currents in this vicinity reach a velocity of 3 knots. The flood current sets NNE and the ebb current sets SSW.

Patches, with depths of 16.5m and 13.7m, lie about 3.3 miles SSW and 6 miles W of Machias Seal Island.

North Rock, 1.2m high, lies about 2 miles NNE of Machias Seal Island. There is a tide rip over the bank surrounding the danger. Rocky patches, with depths of 10.3m, 7.6m, and 14.6m lie 0.2 mile NE, 1.4 miles E, and 0.5 mile SSW of North Rock.

North Shoal, with a depth of 2.7m and on which the sea breaks in heavy weather, lies about 1.5 miles NNW of the island. A shoal, with depths of less than 18.3m, extends about 3.8 miles W of North Shoal. A depth of 9.1m lies on the outer end of this shoal. Tide rips exist in the vicinity of the shoal.



**Gannet Rock Light**

Middle Shoal, about 5 miles NE of Machias Seal Island, has a least depth of 5.2m, breaks in very heavy weather, and shows a tide rip.

**Bull Rock** (44°30'N., 66°57'W.), which dries 0.3m and on which the sea usually breaks, lies about 6.8 miles E of Machias Seal Island. A light and whistle buoy is moored 0.3 mile NE of Bull Rock. Little Shoal, over which there is a tide rip and with least depth of 8.5m, lies about midway between the rock and the island. Two rocky patches, with depths of 8.8m and 9.4m, lie about 1.3 miles SSW and SW, respectively, of Bull Rock, in an area known as Guptill Grounds.

Southeast Ledge, about 5.8 miles SE of Machias Seal Island, has a least depth of 5.2m and breaks only in heavy weather, but is marked by tide rips. Middle Breaker, with a depth of 11m, lies nearly 1.5 miles NW of the ledge. There are tide rips over the shoal and between it and the ledge.

**1.5 Gannet Rock** (44°31'N., 66°47'W.), about 7.5 miles SE of Southwest Head, is a bare islet, about 4.6m high. The W side of the islet is steep-to, but a 2.1m shoal lies 0.25 mile SE, and a 3.4m shoal lies 0.3 mile E of it. A boat landing can be effected on the N side of the islet in good weather, the best time being at LW. The islet is connected by telephone, used for life saving purposes only, with Outer Wood Island. Gannet Rock Light is shown from a white octagonal tower with black vertical stripes, 23m high, with a dwelling attached.

Gannet Rock Bank, with depths of 12.8m, extends 1.3 miles S of Gannet Rock.

**Murr Ledges** (44°31'N., 66°52'W.), most of which dry, lie between Gannet Rock and Bull Rock. Yellow Ledge, about 3.4 miles SW of Gannet Rock, is 3m high, and the highest of the ledges. A rock, with a depth of 1.2m, which breaks in a moderate swell, lies about 0.2 mile E of this ledge. A green

beacon (port hand; radar reflector) is shown on White Ledge, about 2.3 miles NNW of Yellow Ledge.

Southern Ledge Shoal, an isolated 8.8m shoal, and St. Mary Ledge, which dries 5.2m, lie about 1.8 miles WSW and over 0.75 mile E, respectively, of Yellow Ledge.

Kent Shoal, with a depth of 3.4m, lies about 2 miles NNE of Gannet Rock, near the center of an extensive bank, with depths of less than 18.3m. A rock, with a depth of 10.7m, lies about 0.4 mile SSW of Kent Shoal. Outer Kent Shoal has depths of 7.6m and 4.9m about 0.8 mile and 1.3 miles W, respectively, of Gannet Rock.

**Caution.**—Vessels should keep well S of **Machias Seal Island** (44°30'N., 67°06'W.) and Murr Ledges, if practicable, due to the many dangers, the deep and irregular soundings, and the strong tidal currents in the area S of Grand Manan Island.

Other shoals and ledges, which are best seen on the chart, lie N and NW of Murr Ledges and Gannet Rock.

**1.6 Old Proprietor Shoal** (44°33'N., 66°40'W.), a ledge which dries 1.5m, lies about 5.8 miles NE of Gannet Rock. A light and whistle buoy is moored about 0.6 mile SSE of the same shoal. Proprietor Shoal, with less than 1.8m, lies nearly 0.5 mile WNW of Old Proprietor Shoal. Crawley Shoal, with a least depth of 6.7m, extends about 0.8 mile NNW of Proprietor Shoal. Rans Shoal, with less than 1.8m, lies nearly 3 miles south of Long Point. A 3m patch lies 0.25 mile E of Rans Shoal.

Clarks Ground, with a least depth of 9.1m and over which there are heavy tide rips on the ebb (SW) current, lies about 2.5 miles NE of Old Proprietor Shoal. Bulkhead Rip is a very heavy tide rip with the ebb (SW) tidal current, and is caused by the uneven rocky bottom between Clarks Ground and White Head Island.



**Tides—Currents.**—About 3.5 miles S of Old Proprietor Shoal the tidal current at mid-flood sets NE at 2.6 knots, and at mid-ebb it sets SW at 3.9 knots for average tides. In the vicinity of Crawley Shoal, the tidal currents have a maximum rate of from 4 to 6 knots.

## South Shore of Grand Manan Island

**1.7 Southwest Head** (44°36'N., 66°54'W.) is the SW extremity of Grand Manan Island. A light is shown at an elevation of 48m from a white square tower, attached to a white building, situated on Southwest Head. A fog signal of one blast every minute is sounded from the building; the horn points 240°.

MacGregors Reef, with a depth of 6.7m, lies nearly 1 mile S of Southwest Head. A 5.8m patch lies about midway between MacGregors Reef and the headland.

Buck Rock (Black Rock), which dries 2.4m, lies about 0.3 mile offshore on the W side of the entrance to Seal Cove. A lighted bell buoy is moored about 0.5 mile SE of Buck Rock.

Seal Cove lies on the E side of the promontory of Southwest Head. The cove is entered between **South Head** (Columbia Head) (44°35'N., 66°53'W.), about 0.9 mile E of Southwest Head, and Western Green Island, 12.5m high, about 1.5 miles further E; the cove is sheltered on the E by Wood Island. The cove affords good shelter except from S gales, which send in a heavy sea. The W shore is relatively steep-to, but there are projecting ledges off the E shore.

Two groups of conspicuous boulders, locally known as the Upper and Lower Flock of Sheep, are located at the peak of the cliff along the S part of South Head (Columbia Head).

The village of **Seal Cove** (44°39'N., 66°50'W.), where there are two boat harbors, lies at the NW corner of the cove. The inner harbor, which dries, has an entrance 28m wide between two curved breakwaters. A light is shown from a triangular skeleton tower on the outer end of the west breakwater.

The other boat harbor is located to the SW of the inner harbor. This is protected by an outer breakwater and wharf, 280m long, and a breakwater with a wharf close to the N; the entrance between them is 26m wide. A light is shown from a mast at the outer end of the breakwater.

**Tides—Currents.**—The tidal rise at Seal Cove is 6m at springs and 5.2m at neaps.

Anchorage can be taken in 11m, mud, about 0.2 mile SE of the outer breakwater head. Anchorage can be taken further out in 18.3m, about 0.7 mile S of the outer heads and E of Joes Point.

Abandoned submarine cables are laid from the vicinity of the village of Seal Cove to a point on Wood Island, about 0.3 mile west of Joes Point. Another cable runs from Wood Island to Outer Wood Island. Mariners are cautioned not to anchor in the vicinity of the cables.

The passage between the N end of Wood Island and Red Head on the main island is obstructed by shoals and rocky ledges through which there is a channel with a least depth of 4m in the fairway. The channel is marked by buoys.

**Maple Hill** (44°40'N., 66°50'W.), 87m high, lies nearly 1 mile NW of Red Head.

Outer Wood Island lies about 0.7 mile E of Western Green Island. Shag Head Breaker, which dries 1.5m, lies about 0.2

mile SSW of Shag Head, and is marked by a buoy. White Horse Islet, 5.5m high, lies on a rocky ledge extending about 0.5 mile S from the SE extremity of the island. A light is shown from a mast, with a red and white daymark having a black square in the center, on White Horse Islet.

## Grand Harbor Approach

**1.8** The approach to Grand Harbor lies between White Horse Islet and **Long Point** (44°37'N., 66°43'W.), the S extremity of White Head Island, about 4 miles E. A light is shown from Long Point. White Head, a peninsula 21.3m high with conspicuous white cliffs, lies close W of White Head Island.

Cheney Island and Ross Island, each 15m high, lie between White Head Island and Grand Manan Island. Drying flats and ledges join the above four islands. Half Tide Rock, marked by a light, lies on the drying flat between Cheney and Ross Islands.

Three Islands, consisting of Kent Island, Hay Island, and Sheep Island, joined by flats or ledges, lie in the approach to Grand Harbor. A reef, with Eastern Ledge on its outer edge, extends about 0.4 mile E from the central part of Kent Island. Constable Ledge, which dries 2.7m, lies near the outer end of a shallow bank extending about 0.5 mile W from Hays Island and is marked on its NW end by a buoy. Sheep Island Shoal, with a depth of 7m, lies about 0.5 mile W of Sheep Island.

Tinker Shoal, drying 0.6m, lies about 2 miles E of the N extremity of Kent Island, and is marked by a buoy on its N end. Inner and Outer Diamond are two rocks, each of which dries 0.6m, lying close SE of Tinker Shoal.

Green Islands, each 6m high and connected by a bank with a depth of about 4.3m, lie about 1 mile N of Hay Island. A ledge, which dries 1.8m, lies nearly 0.2 mile S of the S island. Green Islands Shoal, with a least depth of 3m, lies about 1 mile WNW of the N island.

**Pumpkin Islet** (44°37'N., 66°44'W.), 6.1m high, lies near the outer end of the bank with depths of less than 5.5m, which extends about 0.4 mile SW of White Head. Long Ledge and Sand Bar Ledge, N of it, dry up to 3.6m, and lie about 0.5 mile W of White Head, in a N-S direction. A buoy marks the S end of Long Ledge, and a lighted bell buoy is moored off the N side of Sand Bar Ledge.

**1.9 Grand Harbor** (44°40'N., 66°45'W.), sheltered by Ross Island, has a depth of 3.7m in the entrance until past Fish Fluke Point. The harbor itself is dry at LW and can be used only by small vessels that can lie aground. There is a government wharf, 57m long, with a depth of 4.6m alongside the head at HW.

Ox Head Ledges, which dry 1.5m, lie on the W side of the entrance to Grand Harbor. A buoy is moored about 0.2 mile SE of the ledges. A buoyed channel leads to the harbor.

## East Shore of Grand Manan Island

**1.10 The Bluff** (44°37'N., 66°42'W.), the SE extremity of White Head Island, lies about 0.9 mile ENE of Long Point. Black Rocks, marked by a beacon, lie about 0.8 mile ESE of

The Bluff. Halibut Rock, with 2.7m and marked close SE by a buoy, lies about 0.5 mile NE of The Bluff.

**Gull Cove** (44°38'N., 66°41'W.) is entered between Prangle Point and Gull Rock. Gull Rock is the NE of a group of ledges. Foul ground, with drying ledges on it, extend about 0.5 mile NE of Prangle Point, and is marked E by a lighted bell buoy. Good anchorage for small vessels may be obtained in 10m, sand, about 275m NW of Gull Rock, sheltered from all winds except those between N and SE.

Great Duck Island lies about 1.5 miles NE of Ross Island, to which it is connected by a spit with depths of less than 5.5m. A light is shown from the S end of the island. A drying ledge extends about 0.5 mile S of the island, and Great Duck Ledge, 0.3m high, lies about 1 mile farther SE. A lighted whistle buoy is moored about 0.5 mile S of Great Duck Ledge. A spit, with a depth of 5.5m at its outer end, extends 0.5 mile SSE of Great Duck Ledge.



**Great Duck Island from S**

Andys Ledge and Edmunds Rock, which dries 2.7m, lie near foul ground extending more than 0.5 mile E of Ross Island. Edmunds Rock Light is shown from a rock, which dries 2.1m, located between Edmunds Rock and Ross Island. Another useful mark, positioned from Great Duck Island Light is a beacon (1.1 miles SW), with a radar reflector on Edmunds Rock.

Anchorage can be taken in about 9.1m, between the S end of Great Duck Island and Andys Ledge. Mariners are cautioned not to anchor in the vicinity of the submarine cable N of the anchorage, and should pass W of the 4.9m patch, about 0.5 mile SSW of Great Duck Island.

Low Duck Island, 4.6m high, lies about 1 mile NNW of Great Duck Island. High Duck Island, 18.3m high, lies about 0.4 mile farther NW. The islands lie on a drying reef.

**Long Island** (44°43'N., 66°43'W.), 23m high, lies about 0.5 mile N of High Duck Island. A rock, which dries 4.6m and is marked by a buoy, lies about 0.3 mile ENE of the S point of the island. A 4.9m patch lies about 0.3 mile S of the rock. Farmer Ledge, 1.2m high and marked by a light, lies on a shallow bar connecting Long Island to Grand Manan Island.

## Long Island Bay

**1.11** Long Island Bay is entered between the N point of Long Island and Swallow Tail, a narrow and bold point about 1.5 miles N. The bay affords shelter from all winds except those between the NE and SE. A light is shown from a white octagonal tower with a white dwelling close by on Swallow Tail.

A shoal, which dries 0.9m, and a patch, which dries 0.6m, lie about 0.2 mile NE and 0.2 mile NW, respectively, of the N point of Long Island. Both dangers are marked by buoys. Dutch Ledge, which dries 4.6m, is an extension of the ledges which fringe the S end of the bay.

Pettes Cove lies between Swallow Tail and Net Point, about 0.5 mile WSW. Net Rocks, the highest of which dry 4.9m, extend about 0.2 mile SE of Net Point. A lighted bell buoy is moored slightly over 0.1 mile S of Net Rocks.

Flagg Cove lies in the N part of the Long Island Bay, W of Net Point. The village of North Head is situated about 0.4 mile NW of Net Point. A Y-shaped jetty extends about 165m WSW into a depth of 6.7m. The S arm of this jetty, known as Ferry Wharf, has a berth about 70m long on its N side with depths from 4.9 to 5.5m. A stern-loading ramp is situated at the root of the wharf. On the S side of the N leg of the jetty there is a berth 22m long with a depth of 4m.

There is a T-shaped jetty situated NW of Ferry Wharf, known as Fisherman's Wharf. The T-head is 205m long, with a least depth of 2.7m alongside, except for a 0.6m shoal near the E end. A floating slip is situated on the west side of the approach section to Fisherman's Wharf. There is a hand operated derrick on Fisherman's Wharf.

**Anchorage.**—There is good anchorage in a depth of about 9m, mud, about 0.5 mile SW of the N end of Long Island. This anchorage is exposed to winds between the N and NE.

There is also anchorage about 0.3 mile WSW of Net Point in about 20m, stiff clay, or closer inshore in Flagg Cove in about 10m, but these berths are exposed to the E and SE winds.

The coast from Swallow Tail to Fish Head, about 1 mile NNW, is bold with steep cliffs. Fish Head forms the E entrance point of Whale Cove, which affords good temporary anchorage, sheltered from S winds, in depths of 9.1m, about 0.3 mile offshore.

**Northern Head** (44°48'N., 66°47'W.), the N point of Grand Manan Island, lies about 2 miles NW of Fish Head. The extreme NW point of Grand Manan Island, Long Eddy Point, so named from a remarkable tide rip that darkens the water in the vicinity of the coast, lies close W of Northern Head. A light is shown near the point.

## Grand Manan Channel

**1.12** Grand Manan Channel is the passage between the W side of Grand Manan Island and the coast of Maine, between West Quoddy Head and Western Head, about 14.5 miles SW. The S entrance lies between **Western Head** (44°39'N., 67°11'W.) and Southwest Head. There are no dangers in the fairway. Machias Seal Island and the dangers SW and S of Grand Manan Island have been previously described.

Grand Manan Channel is the most direct passage for vessels bound up the Bay of Fundy from along the coast of Maine. It is



Swallow Tail Light

also the safest passage up the Bay of Fundy, not only due to its freedom from shoals, but also because it is less subject to fogs than is the passage E of Grand Manan Island.

**Winds—Weather.**—It is reported that fog often persists close in to the Maine coast between Machias Bay and West Quoddy Head, extending about one third of the way across Grand Manan Channel, while the rest of the channel may be entirely free of fog.

**Tides—Currents.**—The tidal currents set through Grand Manan Channel at velocities of from 1.5 to 2.5 knots. The current sets approximately parallel to the channel, the flood setting NE and the ebb SW. Off the W coast of Grand Manan Island the currents run parallel to the shore at a velocity of about 3 knots.

### West Coast of Grand Manan Island

**1.13** The W coast of Grand Manan Island from **Southwest Head** (44°36'N., 66°55'W.) to the entrance to Dark Harbor, 9 miles NNE, is wooded with steep rocky cliffs from 91 to 107m high and free from dangers. Bradford Cove, a small bight about 2 miles NNE of Southwest Head, affords temporary anchorage with offshore winds in depths of 14.6 to 18.3m. Dark Harbor is a remarkable inlet with depths of 9 to 13m, the mouth of which is almost closed by a shingle beach.

The coast from Dark Harbor to Long Eddy Point continues bold and wooded, with an elevation of about 122m. A ledge extends about 275m NW from Long Eddy Point.

### Northwest Side of Grand Manan Channel

**1.14 Little River Island** (44°39'N., 67°12'W.), in the middle of the entrance to Little River, is wooded and rocky, and can be recognized by the white conical tower on its NE corner. Little River, entered N of Little River Island, is small and easy to access through a channel with a depth of about 8.5m. It is an excellent harbor of refuge, sheltered from all winds, and never obstructed by ice. Two tree-covered islets off Western Head, on the S side of the entrance and a tree-covered islet on the N side of the river entrance, are conspicuous.

From Little River to West Quoddy Head, about 14.5 miles NE, the coast is mostly high, rocky, wooded, and steep-to. The only off-lying dangers are an unmarked 3.7m shoal, about 0.2 mile offshore, about 1.8 miles ENE of Little River Island, and Morton Ledge, with a depth of 1.8m and marked by a buoy, about 0.4 mile offshore and about 2.3 miles SW of West Quoddy Head Light.

The coast is broken by a number of unimportant coves. The largest of these, Moose Cove and Baileys Mistake, appear from seaward to be good open anchorages, but neither has good holding ground nor any value as a harbor of refuge. Both have ledges at their entrances and afford shelter from N winds only.

**West Quoddy Head** (44°49'N., 66°57'W.), the E point of the United States, is bold, high, and wooded. West Quoddy Head Light is shown from a white and red banded tower on the E edge of the headland. The abandoned Coast Guard lookout tower, 70m high, near the summit of the ridge about 0.5 mile W of the light, is the most conspicuous landmark in the approach to Quoddy Narrows from seaward.

A radio tower, 27.7m high, stands about 40m NW of the light. The fog signal is sounded at the light.

Sail Rocks are two small rocks above-water that lie near the outer end of a ledge extending about 0.3 mile SE of the light. A lighted whistle buoy is moored about 0.4 mile SE of the rocks. During the strength of the tidal current, a strong tide rip extends 0.75 mile SE of Sail Rocks, and they should be given a wide berth.

A submerged power cable is laid across Grand Manan Channel between Campobello Island and Grand Manan. "No Anchorage" signs are situated at each shore end of the cable.

## Passamaquoddy Bay Approaches

**1.15** Passamaquoddy Bay indents the shore between Maine and New Brunswick, and has a maximum length of about 10 miles in a NNE-SSW direction. The bay is never closed by ice and affords excellent shelter for all classes of vessels. The boundary between the United States and Canada extends through Quoddy Roads, Lubec Channel, and Friar Roads, and then passes between Deer Island and Moose Island, and continues parallel with the Maine shore up the St. Croix River. The line is marked by numerous ranges consisting of small pyramidal concrete beacons that should not be mistaken for navigational aids.

Across the entrance to the bay is a group of islands, of which the largest are Campobello Island and Deer Island. The principal channel of entrance, Head Harbour Passage, is between these two islands. Lubec Channel, between Campobello Island and the mainland to SW, is narrow and limited in depth, but is frequently used by small vessels, especially at HW. Letite Passage, the N entrance to the bay, is narrow and dangerous, and only available with local knowledge.

**Tides—Currents.**—The main flood current from Grand Manan Channel sets NE, directly for **Point Lepreau** (45°03'N., 66°28'W.), and the ebb sets in the opposite direction. The W branch of the flood current passes along the E side of Campobello Island, and divides near East Quoddy Head, one part setting E, while the other sets through the various entrances into Passamaquoddy Bay. With both flood and ebb currents an indraft is often experienced into the indentation between Grand Manan Island and Point Lepreau.

**Pilotage.**—Pilotage is compulsory for all foreign vessels and U.S. vessels over 1,000 grt for Eastport and Friar Roads when entering through Head Harbour Passage. Pilots will board off West Quoddy Head, or if arriving from ports in the Bay of Fundy, off East Quoddy Head. Pilots will embark from a white double ended fishing vessel; communications by VHF channel 16.

Pilots for St. Stephen may be obtained at Head Harbour, **Welshpool** (44°53'N., 66°58'W.), or **Lords Cove** (45°00'N., 66°57'W.). Pilots for Calais usually board 1 mile off Head Harbour Light or at Eastport.

**1.16** The Wolves, a group of wooded, steep-to islands, 15.2 to 33.5m high, lie in the N approach to Passamaquoddy Bay. **South Wolf Island** (Southern Wolf Island) (44°56'N., 66°44'W.) the S island of the group, lies about 8.5 miles NNE

of Grand Manan Island. East Wolf Island (Eastern Wolf Island), the NE and largest of the group, lies about 1.5 miles NNE of South Wolf Island. Three smaller islands lie between the above two islands. The passages between these islands are suitable for boats only. Wolf Rock, above-water, lies about 0.2 mile N of the N end of East Wolf Island. A small rock, above-water, lies about 0.1 mile E of Wolf Rock, from which it is separated by deep water.

South Wolf Island Light is shown from a white round tower, 9m high, on the S end of the island.

A lighted whistle buoy is moored about 1.5 miles N of East Wolf Island.

**Anchorage.**—In thick weather, or while waiting for favorable tides, anchorage can be taken in 36.6 to 45.7m, good holding ground, about midway between the group and the mainland N.

## Quoddy Narrows and Lubec Channel

**1.17 Quoddy Narrows** (Quoddy Roads) (44°50'N., 66°57'W.), between West Quoddy Head and the S end of Campobello Island, is used as an anchorage by vessels seeking shelter or waiting for a favorable tide to pass through Lubec Narrows. The entrance between The Boring Stone and West Quoddy Head is about 0.8 mile wide, with a depth of 8.5m near the middle.

The Boring Stone, 1.5m high, lies about 0.3 mile SW of **Liberty Point** (44°50'N., 66°56'W.), and should be given a safe berth. Middle Ground, with a depth of 1.2m, lies in the middle of Quoddy Narrows. The N and W parts of Quoddy Narrows between West Quoddy Head and Lubec are full of shoals which partly uncover.

The anchorage affords shelter from N and W winds in depths of 3.6 to 7.6m, but is open to winds from the E and S, and protection from NE gales is reported poor.

A local magnetic anomaly exists SE of Liberty Point, 0.75 to 1 mile. Abnormal compass variation has also been reported about 2 miles E of Herring Point.

Lubec Channel and Lubec Narrows, between Quoddy Narrows and Friar Roads, have been improved by dredging. The controlling depth in the channel was 1.1m. Strong tidal currents and eddies are experienced in the Narrows. The channel is buoyed, but it is inadvisable to use this passage without local knowledge.

**Tides—Currents.**—The mean range of the tide at Lubec is 5.3m, but tidal ranges over 6.1m are not uncommon.

In the channel, the flood current sets N and the ebb S, with a maximum velocity of 4 knots. In the Narrows, the velocity increases to 6 knots with the flood current of spring tides, and 8 knots with the ebb current of spring tides.

In Quoddy Narrows and Lubec Narrows, the flood current commences to run about 1 hours 30 minutes before LW by the shore, and the ebb current about 1 hour before HW.

**1.18 Lubec** (44°52'N., 66°59'W.) (World Port Index No. 6610), on the W side of Lubec Narrows, has two fish canning factory wharves. One is an L shaped fish pier (0.2 mile N of the bridge), extending 76m into the narrows with depths alongside the outer face; fuel can be delivered by road tanker. The other is an L-shaped concrete fish pier extending 52m from the N



side of the town, the outer face being 19m long; reported depths alongside are 1.8 to 4.3m. Both the canning factories have piers which dry.

Lubec is distinguished by a tall church spire on a hill and an elevated tank on the N shore of the town. Franklin D. Roosevelt Memorial Highway Bridge, a fixed highway bridge with a vertical clearance of 14.3m, crosses Lubec Narrows at Lubec. The navigable span of the bridge is marked by a green light in the center and by red lights at the E and W sides. These lights are visible from N and S of the bridge.

Popes Folly, a thinly wooded islet, is 17m high and lies off the N entrance to Lubec Narrows. It is connected to the shore SE by a bar with a depth of 3.7m. The bar is crossed by vessels bound S to Lubec or through Lubec Narrows.

Dudley Island, about 0.7 mile farther NW, is connected to Treat Island by an earth dam.

## Campobello Island

**1.19** Campobello Island is the S and largest of the islands in the entrance to Passamaquoddy Bay. The E coast of the island, from Liberty Point to **East Quoddy Head** (44°57'N., 66°54'W.), its N extremity, about 8 miles NNE, is steep-to off its salient points.

**Herring Bay** (Herring Cove) (44°52'N., 66°56'W.) affords good temporary anchorage in depths of 11 to 14.6m, about 0.5 mile offshore.

Schooner Cove, about 2 miles farther NNE, affords temporary anchorage to small vessels in depths of about 11m.

Mill Cove, entered N of **Scott Head** (44°56'N., 66°54'W.), affords temporary anchorage to small vessels in 7.3 to 11m. A 0.8m patch, marked by a buoy, lies in the entrance, about 0.3 mile NNW of Scott Head.

East Quoddy Head, the N extremity of Campobello Island, is extended about 0.3 mile NE by a reef on which there are several islets. **Head Harbour Light** (44°57'N., 66°54'W.) is shown from a 15m high white octagonal tower on the outer islet.

Head Harbour, protected from the E by Head Harbour Island, 24.4m high, with its N end about 0.3 mile SE of East Quoddy Head, is a secure anchorage for small vessels. A narrow creek extends about 0.8 mile SW from the head of the harbor.

The harbor is entered passing either N or S of Head Harbour Island. The N channel, partially marked by buoys, is the preferred entrance, the S channel being obstructed by shoals and fish weirs. A light (triangular framework tower, 7m high) is exhibited from the NW side of the entrance to the creek.

An L-shaped public pier, 97m long and 12m wide at its outer end, with a depth of 5.2m alongside, is situated on the N side of the harbor. It is frequently used by fishing vessels. Numerous mooring buoys are laid S and E of the pier.

**Caution.**—Strong E to NE winds against the ebb current will create a breaking sea off East Quoddy Head.

## Head Harbour Passage

**1.20** Head Harbour Passage, the main channel to Passamaquoddy Bay, is entered from seaward between East Quoddy Head and Spruce Island, about 0.8 miles NNW of



Head Harbour Light

Head Harbour Light. The passage runs between the NW side of Campobello Island and a chain of islands located about midway between Campobello and Deer Islands. The passage leads to Western Passage, the main entrance to Passamaquoddy Bay, through the N end of Friar Roads.

**Tides—Currents.**—As the flood current rounds East Quoddy Head, it will set strongly to the W onto Spruce Island and Black Rock, following the general direction of the passage S. Rates of up to 5 knots have been obtained, but the W flow weakens considerably during the last hour of the flood.

**White Horse Island** (45°00'N., 66°52'W.), about 2.3 miles NE of East Quoddy Head, is 20.7m high, bare, rocky, of whitish appearance, and easily identified. Little White Horse Ledges consists of a rock, with a depth of 0.3m, about 0.1 mile NE of White Horse Island, and a second rock, with a depth of less than 1.8m, about 0.1 mile NW of the first rock.

North Rock, with a depth of 0.3m, and steep-to except on its N side, lies about 0.5 mile NW of White Horse Island, and is marked SE by a buoy.

Spruce Island, about 0.8 mile N of East Quoddy Head, lies on the NW side of the passage, and is steep-to on its SE side. White Island lies about 0.5 mile N of Spruce Island.

Sandy Island, about 0.3 mile W of Spruce Island, has ledges extending about 0.4 mile SSW, with the outer end of the ledges marked by a radar reflector.

Tinker Island (Tinkers Island), steep-to on its W side, lies about 0.5 mile W of Sandy Island. Two ledges, which dry, lie 0.25 mile NE, and the same distance SW of the island. Both ledges are marked by radar reflectors.

Dinner Island lies about 1 mile NW of Tinker Island. The entrance to Northwest Harbor lies about 0.2 mile W of Dinner Island. This harbor is a narrow inlet, with depths of 11 to 12.8m, and is suitable only for small vessels.

Black Rock, which covers at HWS, lies about 0.5 mile SW of Spruce Island and is marked by a radar reflector.

Casco Bay Island, 26m high, lies about 0.5 mile SW of Black Rock and is steep to on its SE side. Ledges extend 275m off its N end, and shoals and ledges lie within 0.35 mile SW of the island.

Green Island, on the NW side of the passage, lies nearly 0.5 mile SW of Casco Bay Island. A shoal, with a charted depth of 7.3m and marked close E by a buoy, lies in mid-channel, about 0.3 mile E of Green Island. Sandy Ledge, about 0.3 mile W of Green Island, is marked by a radar reflector.

Popes Island, 17m high, lies about 0.5 mile SW of Green Island. Popes Shoal, with a least charted depth of 2.7m, lies about 0.2 mile SE of Popes Island, and a 7.3m spot lies about 0.2 mile E of Popes Shoal. Chocolate Shoal, with a least charted depth of 2.4m, lies nearly 0.5 mile W of Popes Island.

**1.21 Windmill Point** (44°56'N., 66°57'W.), about 2.5 miles SW of East Quoddy Head, is the N entrance point of Harbour de Lute. A 5m rocky shoal lies nearly 275m W of the point. At the village of Wilsons Beach, about 0.3 mile NE of Windmill Point, there is a U-shaped breakwater-wharf that extends 75m to an outer part that is 57m long. The harbor is shoal; however, there is a depth of 2.1m along the outer 24m of the inner side.

The remains of an obstruction are reported to lie about 60m off the W part of the outer part of the mole.

A submerged power cable is laid between Wilsons Beach and Chocolate Cove on Deer Island. "No Anchorage" signs are situated at the shore ends of the cable.

Harbour de Lute is entered between Windmill Point and Bald Head, 31m high, about 1 mile SSW. Man of War Head, the inner entrance point, lies about 0.8 mile NE of Bald Head. Stovers Ledge, with a least depth of 6.1m, lies about 0.5 mile NE of Bald Head. Racer Rock, with a depth of 2.7m, lies about 0.3 mile ENE of Man of War Head.

Anchorage, with good shelter, can be taken in Harbour de Lute in depths of about 22m, N of Man of War Head.

Indian Island, 33m high near its N end, lies about 0.3 mile E of Deer Island, from which it is separated by a deep channel. A shallow bank extends about 0.8 mile off the SE part of Indian Island. Cherry Islet, 15.8m high, lies at the SE end of this bank. A light, 8m high, is shown from the S end of the island. Thumcap (Thumb Cap), 25.3m high, lies about 0.3 mile N of Cherry Islet.

Friar Roads (Eastport Harbor), between Campobello Island and **Moose Island** (44°55'N., 67°00'W.), is sheltered and free

from ice, but the water is deep, the bottom uneven, and the tidal currents strong. It is seldom used as an anchorage.

**1.22 Eastport** (44°54'N., 66°59'W.) (World Port Index No. 6600) lies on the hilly E side of Moose Island. It is the easternmost deep-water port of the United States and is a port of entry. The principal industry is fishing, with its attendant canning, smoking of herring, and manufacturing of by-products.

On the waterfront, the customhouse, with its square tower, is conspicuous. The spire of a church, lying about 275m WSW of the customhouse, and the storm warning signal tower on a hill overlooking the town, are also conspicuous. Numerous fluorescent orange pylon boundary markers on the tops of the hills are also conspicuous.

A dredged small craft harbor for commercial and pleasure craft is located off the customhouse. The basin is protected on its N and E sides by a solid-filled L-shaped breakwater onto which fishing vessels can unload their catch into trucks. There were depths of 4m and 2.7m in the S and N parts, respectively, of this basin. In fair weather, berthing is available along the 125m long E face and the N face of the breakwater in depths of 11m and 2.1m, respectively. The breakwater is floodlighted at night.

**Pilotage.**—See Passamaquoddy Bay Approaches, paragraph 1.15.

Deep-draft vessels may anchor off the town in a depth of about 29m, with the light on Cherry Island bearing 017°, at a distance of about 2.1 miles, about 0.5 mile off the city. The bottom here is broken and rocky, and the tidal currents are strong, and the anchorage is not recommended with E winds, when improved conditions will be found in Broad Cove or Friars Bay.

**Friar Bay** (Friars Bay) (44°53'N., 66°52'W.) lies on the SE side of Friar Roads. Friar Head (Friars Head), 55m high and wooded, is the S entrance point of the bay. There is good anchorage in the bay in about 22m, with the surrounding shore 0.5 mile distant. Small vessels can lie alongside the L-shaped government wharf at the village of Welshpool in the N end of the bay. The wharf has a face 65m long with a depth of 4.3m alongside.

## Western Passage

**1.23 Western Passage**, between Moose Island and Deer Island, connects Friar Roads with Passamaquoddy Bay. The passage is entered between Deer Point, the S extremity of Deer Island, and **Dog Island** (44°55'N., 66°59'W.), 6.1m high, about 0.5 mile SSW. Lights are shown from Deer Point and Dog Island.

**Tides—Currents.**—Off Deer Point, abreast Dog Island, the current forms whirlpools and eddies which may be dangerous. The flood and ebb current usually run at about 3 knots, but may attain a rate of 6 to 7 knots. It is reported to be the most active about 3 hours before HW. The least disturbance is usually about 275m N of Dog Island, where there is a comparatively narrow direct current which can be readily followed between

the whirlpools and eddies on either side. A fish pen is established close S of Kendall Head.

Above Deer Point the flood sets N with decreasing velocity and follows the general direction of the channel with strong countercurrents and eddies close to the shore. The ebb sets S with reduced velocity and disturbance off Deer Point, and the inshore reverse currents are less marked than the flood. The flood and ebb currents usually run about 3 knots, but a rate of 5 knots has been observed.

Clark Ledge, which dries 5.8m and is marked by a daybeacon, lies about 0.1 mile offshore, about 0.3 mile SE of Dog Island.

The coast between Dog Island and Kendall Head, about 1.5 miles NW, recedes forming a bight. Kendall Hill, 56m high, lies close W of Kendall Head. Good anchorage for deep-draft vessels is available in Johnson Cove in the NW part of the bight.

Pleasant Island, about 2 miles NW of Kendall Head, lies about 275m offshore, near the outer end of a drying spit.

Frost Island lies about 0.7 mile NW of Pleasant Island. Frost Ledge, which dries in places and is marked by a bell buoy, lies about 0.3 mile NE of the island, to which it is joined by a shoal spit.

**Clam Cove Head** (44°58'N., 67°01'W.), on the NE side of the passage, lies about 1 mile E of Pleasant Island. At Fairhaven, there is a public pier with depths of 1.8 to 2.4m alongside the outer face, which is 26m long. A slip is situated on the SE side of the pier and a light is exhibited from the pier head. A large fish canning factory stands at the root of the pier.

Clam Cove, close E of the headland, provides good, but limited anchorage in a depth of 16.5m, about 0.2 mile E of the S point of the headland. A beacon marks some rocks that lie about 95m S of the headland.

## Northeast Part of Deer Island

**1.24 Bean Island** (45°00'N., 66°56'W.), 27m high, lies in the entrance to Lords Cove, where there is a government pier, 100m long, with a depth of 2.1m at the outer end.

Fish Harbor is entered between Bean Island and Fish Island, about 0.4 mile NNE.

**Fish Island** (45°01'N., 66°56'W.) lies on the S part of a shorebank on which there are many islands, ledges, and rocks which extend more than 1 mile E from the NE side of Deer Island. Parker Island, the NE of these islands, lies about 1 mile E of the N extremity of Deer Island. Splitting Knife Ledge, which dries 6.4m, lies about 0.1 mile E of Parker Island and is marked by a radar reflector. Adam Island, about 1 mile SSE of Parker Island, has rocky ledges extending about 0.2 mile off its N and E sides.

**McMaster Island** (45°03'N., 66°56'W.), 106.7m high, lies with Grass Point, its SE extremity, about 0.4 mile NNE of Parker Island.

## Letite Passage

**1.25** Letite Passage, the N entrance to Passamaquoddy Bay, lies between Parker and McMaster Islands, off the N end of Deer Island and the mainland of New Brunswick, N of **Greens Point** (Mascabins Point) (45°02'N., 66°54'W.). The

passage is relatively deep, but unmarked dangers and strong tidal currents render its navigation difficult. It should not be attempted without local knowledge.

**Caution.**—The tidal currents form strong swirls, eddies, and boils. They attain rates of about 5 knots and are strongest both 3 hours before and after HW.

Letite Passage is not recommended for vessels larger than 1,200 grt. Transit of the passage is best made 45 minutes either side of HW. Large alterations of course should be avoided at all times.

Greens Point is marked by Letite Passage Light, shown from a white tower, 13.1m high. Morgan Ledge extends about 230m SW of the point, and is marked by a light, shown from a red mast near its SW extremity.

Black Ledge, which dries 7m, lies about 0.7 mile WSW of Greens Point and is marked by a radar reflector on its W side. New Lid Ledges, with a depth of 0.9m, lie from 0.1 to 0.2 mile S of Black Ledge, and Black Ledge Rocks, with a least depth of 1.5m, extend about 0.2 mile E of Black Ledge.

Mohawk Island, 25m high to the tops of the trees, lies in mid-channel, about 0.5 mile W of Greens Point. Ledges and rocks extend about 0.2 mile SE, and a 2.1m depth lies about 275m E, respectively, of the island. Mohawk Ledge, which dries 5.8m, extends about 274m NNE of the island.

A rocky shoal, with a least depth of 6.1m, lies between 0.25 and 0.35 mile NNE of Mohawk Island.

The NE side of Letite Passage is indented by many small coves. From Greens Point, the coast trends N for 1 mile to the entrance to Matthews Cove, and then about 1.5 miles NW to McMahon Point, the N entrance point to Passamaquoddy Bay.

Chambers Rock, with a depth of 0.6m, lies about 0.1 mile offshore and 0.35 mile NNW of Greens Point. Matthews Rock, with a depth of 1.8m, lies about 0.3 mile farther NW. Buoys mark the rocks.

Matthews Cove, on the E side of the entrance to Letite Harbor, is entered about 0.8 mile N of Greens Point. At the S entrance point of the cove there is a 70m long ferry wharf. To the S of the ferry wharf there is a combined wharf and breakwater, which extends about 70m from shore to a depth of about 2.4m. A lighted buoy is moored in the approach to Matthew Cove and Letite Harbor.

Dry Ledge, 1.2m high, lies in the center of Letite Passage, about 0.5 mile N of the E extremity of McMaster Island. A 60m tower stands on the ledge. A high power overhead transmission cable runs from the mainland via Dry Ledge to McMaster Island. The minimum clearance above Letite Passage is 39m.

Little Dry Ledge, which dries 0.9m, lies about 0.1 mile SE of Dry Ledge. Whorls Rock, with a least depth of 2.7m, lies about 275m off the coast of McMaster Island, and about 0.3 mile ESE of Deadmans Head, the N extremity of that island. Thumb Island, 13.7m high and surrounded by drying ledges, lies near the middle of the N entrance to the passage, nearly 0.5 mile ENE of Deadmans Head. Deadmans Ledge extends about 0.1 mile NW of the latter headland. A lighted buoy is moored close NE of the ledge.

Little Letite Passage, narrow and shallow, leads between the S side of McMaster Island and the N sides of Parker, Jameson, and several other islands N of Deer Island. It is available to

small craft with local knowledge, and its W end is crossed by an overhead cable with a clearance of 41m.

## Passamaquoddy Bay

**1.26 Calders Head** (44°58'N., 67°01'W.), on the W side of Deer Island, lies about 0.5 mile NNW of Clam Cove Head (see paragraph 1.23). From Calders Head, the coast trends NE for about 0.7 mile to the S entrance point of Northern Harbor, a small drying inlet. Gardner Point, the N entrance point of the harbor, lies about 0.3 mile further NE. Above-water rocks lie about 275m SW of the point. From Gardner Point, the NW coast of Deer Island is clear of dangers outside of about 0.1 mile offshore.

**Tides—Currents.**—With the exception of the waters near its entrance passages and at the mouth of the St. Croix River, tidal currents in the bay seldom exceed 0.5 knot.

Pendleton Island, 77m high, lies close N of Deer Island and is separated from it by a shallow, narrow passage, obstructed by rocks. The W and N sides of the island are free of dangers.

The E coast of the bay, between **McMahon Point** (Upper Green Point) (45°04'N., 66°55'W.) and Clark Point, about 1 mile N, recedes forming a bight where temporary anchorage can be taken. A bank, with depths of less than 5.5m, extends about 0.3 mile W from the shore, about 1 mile N of Clark Point.

**Midjik Bluff** (45°07'N., 66°55'W.), 39m high, is a steep rock face that is red; it is the S entrance point of Magaguadavic River. Small vessels can anchor in the entrance of the river in depths of 18.3m, about 0.4 mile SE of Midjik Bluff. The river is navigable by small craft at LW to the town of St. George, about 3.5 miles above the mouth. The channel, which is easily discernable at LW when there is a least depth of 1.2m, is marked by buoys and leads between cliffy banks and high hills on either hand. A government wharf at St. George has a berth on its E side, 52m long and 16.7m wide, with a dredged depth of 3m.

The N shore of the bay, between Midjik Bluff and **McCann Head** (45°07'N., 67°02'W.), about 5.3 miles W, is indented by Digdequash Harbor and Bobabec Cove, both of which form the mouths of small rivers. Long Island, 29m high, and Hog Island, 12m high, lie at the entrance to Digdequash Harbor.

**Bocabec Bay** (45°09'N., 67°01'W.) is entered between Creighton Point and McCann Head, 1.75 miles SW. Vessels can anchor in the bay; the bottom is mud with good holding ground. Good anchorage was reported in 16.5m, about 0.6 mile SW of Creighton Point.

Hardwood Island, 9.1m high, and Hospital Island, close W, to which it is almost connected by drying ledges, lie E of McCann Head. Fish weirs extend 0.2 to 0.3 mile from the W end of Hospital Island, from the N end of Hardwood Island, and between the two islands.

Chamcook Harbor, on the W side of Passamaquoddy Bay, is entered between McCann Head, off of which there is a rock, awash, and the N point of Minister Island, about 0.5 mile SW. The S end of the harbor is closed by a drying spit which connects the island to the shore. The entrance channel, N of Minister Island, has a depth of 5.5m, is about 91m wide, and is marked by buoys. Anchorage can be taken by small vessels in depths of 12.8 to 14.6m.

**Caution.**—The waters of Passamaquoddy Bay and adjoining inland waters contain numerous lobster pots. Small painted wooden buoys of various designs and colors, secured by small lines, float on the surface. In some cases a second buoy, usually not painted and difficult to see, is attached to the lobster trap. Fish weirs are also numerous in these waters, and they may not show at or near HW. Vessels are cautioned against fouling fish weirs and lobster pots.

**1.27 Indian Point** (45°04'N., 67°02'W.), the SE extremity of St. Andrews Peninsula, lies about 1.8 miles S of the S extremity of Minister Island. Stony ledges extend 0.5 mile SE of the point. Tongue Shoal, which dries 5.2m, lies from 0.25 to 0.75 mile E of the SE extremity of the above stony ledge, to which it is joined by a bar with depths of 3m or less. Tongue Shoal Light is shown from a red mast, 9m high, near the E end of the shoal.

**Navy Island** (St. Andrews Island) (45°04'N., 67°03'W.), 12.5m high, lies with its SE extremity about 1 mile SSW of St. Andrews Point. The SE end of Navy Island consists of a wedge-shaped white cliff, 11m high, which is conspicuous from the S or E.

Navy Bar, a stony flat which dries up to 4.3m, extends about 0.2 mile SE from Navy Island, and up to 0.4 mile NE from the NE side of the island. The SW side of the island may be approached to within a short distance.

Niger Reef, about 0.3 mile WNW of the NW extremity of Navy Island, dries 2.1m and is marked by a buoy. Drying stone flats almost join the NW extremity of the island to Joes Point, about 1 mile NW.

**1.28 Port St. Andrews** (45°04'N., 67°03'W.) (World Port Index No. 6570), formed between Navy Island and the town of St. Andrews, is open all year, restricted by drying flats, and should not be entered without local knowledge. Two narrow channels lead across the drying flats and into the harbor.

The main entrance is the E dredged channel, marked by buoys, with a least depth reported of 3m. North Point lies on the N side of the E entrance, nearly 0.5 mile W of Indian Point. A government wharf, 259m long, with a 46m outer face having a depth of 2.4m, lies about 0.4 mile NW of North Point.

The Western Channel, between the flats extending SE from Joes Point and the NW from Navy Island, has a least reported depth of 2.1m.

The tidal rise at St. Andrews is 7.3m at MHWS, and 6.4m at MHWN.

Lights are exhibited from North Point and from the outer end of the wharf. The Algonquin Hotel, with a red roof and a water tower close W, situated on a hill overlooking the town, are conspicuous.

**Anchorage.**—There is anchorage in 18.3m, clay, about 0.4 mile S of Joes Point.

## St. Croix River

**1.29** The St. Croix River, from its entrance between **Joes Point** (45°05'N., 67°05'W.) and Liberty Point, extends about 6 miles NNW to Devils Head, 103.6m high. At Devils Head the river turns WNW, decreasing in width, and continues about 6 miles to the head of navigation. Navigation of the river during



the winter is usually not hindered by ice, but during severe weather, the river has been reported to be blocked by ice for one or two weeks in February.

**Tides—Currents.**—Between the mouth of the St. Croix River and Devils Head, the tidal currents have a velocity of about 2 knots. Between Devils Head and St. Stephen, the velocity is from 3 to 4 knots. In the river, the flood tidal current sets N with countercurrents inshore on both sides where conformation of the land is favorable for them. The ebb current sets S with less marked countercurrents.

**Pilotage.**—Pilotage is not compulsory. (See "Passamaquoddy Bay Approaches," paragraph 1.15.)

Two shoals, with depths of 4.2m and 3.9m, lie about 0.3 mile NW and 0.4 mile WNW, respectively, of Joes Point. A buoy is moored close SW of the W shoal. About 0.4 mile N of Joes Point, there is a government biological station. The L-shaped wharf at the station is connected to land by a 91m long stem. The W face is 49m long, with a least depth of 4.9m. The N face is 30m long, with a depth of 4.3m alongside.

The E side of the river, from Joes Point to Sand Point, about 4.5 miles NNW, is free of off-lying dangers. A T-shaped wharf, extending 91m from the shore, lies about 1.3 miles N of Sand Point. The outer face is 241m long, with depths of 7.5 to 8.5m alongside. A berth on the inner face is 80m long with a depth of 6.5m.

**St. Croix Island** (45°08'N., 67°08'W.) lies in midriver, about 0.6 mile S of Sand Point. The island is surrounded by rocks and shoals, and a bank with several drying ledges extends about 0.5 mile S of the island. A buoy marks the E side of the shoal extending about 0.1 mile E of the island. St. Croix River Light, 31m above water, is shown above a platform on a white tower on the island.

Lower Middle Ground, awash, lies about 1 mile SSE of St. Croix Island and is marked E by a buoy.

Todds Point, about 1 mile N of Devils Head, is the W entrance point of Oak Bay, a shallow inlet of no commercial importance.

**Caution.**—Mariners without local knowledge should not proceed W of Spruce Point, which lies about 1 mile W of Todds Point.

From The Narrows, about 1.8 miles farther upstream, a dredged channel leads to Calais and St. Stephen. The channel is marked by buoys, but is not maintained. The channel from The Narrows to Todd Point, about 1.3 miles NW, has a depth of 2.1m. From Todd Point to Calais and St. Stephen it has a depth of 1.5m and shoals to 0.9m, about 25m E of the International Bridge.

At **St. Stephen** (45°11'N., 67°17'W.), there is a wharf at an inactive fertilizer plant, which in recent years has been used by small coastal tankers to unload petroleum products.

At **Calais** (45°11'N., 67°17'W.) (World Port Index No. 6590), most of the wharves are in ruins and dry at LW. There is a town wharf, 13m long, with a depth of 1.2m alongside.

## Back Bay

**1.30 Back Bay** (45°02'N., 66°52'W.), on the E side of the approach to Letite Passage, lies between Frye Island and its off-lying islets, and the mainland NW. The bay is entered between White Head, the W extremity of **White Head Island**

(Pain Island) (45°01'N., 66°52'W.), and Greens Point, 1.5 miles NW.

Cailiff Rocks, which dry 2.4m, and are marked W by a buoy, lie about 0.5 mile NNW of White Head. A 0.3m rocky shoal lies about 275m WNW of White Head. A rocky patch, with a minimum depth of 2.1m, lies about 0.8 mile NNW of White Head. A buoy is moored close W of this shoal.

Douglas Island, about 1.4 miles NE of White Head, is bordered by a line of fishing stakes, marked at the E and W ends by a beacon (each a pole with a radar reflector, 0.6m in height), and extending about 0.2 mile SW of the island. Numerous fish weirs and cages are situated on this shoal. A shoal area, with a least depth of 3.7m, lies about 0.4 mile SW of the island. Drying ledges extend about 0.3 mile off the N shore, about 0.7 mile E of Greens Point.

In Back Bay, there is a public wharf about 98m long with an L-shaped extension about 111m in length. There are depths of 2.7 to 3.7m alongside the outer faces of the wharf. The wharf is protected by a breakwater extending from the shore to Halftide Rock. Back Bay Light is shown from the outer end of the breakwater from a green skeleton tower.

**Anchorage.**—There is anchorage for small vessels in 11 to 12.8m, about 0.3 mile S of the breakwater head. Larger vessels may anchor in the outer part of the bay, remaining clear of the submerged power cable laid from Bliss Island Light to the mainland. Mariners are cautioned not to anchor in the vicinity of this cable or an abandoned cable nearby.

**1.31 Letang Harbor** (45°04'N., 66°49'W.) (World Port Index No. 6561), sheltered, deep, and open throughout the winter, lies on the NE side of the approach to Letite Passage. The SE approach to the harbor lies between **Deadman Head** (45°02'N., 66°47'W.) and the E end of Bliss Island, about 1.8 miles W. The SW approach to the harbor is through Bliss Harbor, NW of Bliss Island.

Deadman Harbor, entered between Deadman Head and Pea Point, about 1 mile W, is a deep indentation, open SW. Halftide Rock lies about 0.1 mile WSW of Deadman Head.

**Pea Point** (45°02'N., 66°49'W.) is the W end of Pea Island, which lies close off the peninsula, in the E side of Letang Harbor entrance. Drying ledges extend 95m SW of the island, and Pea Rock, which dries, lies about 230m ESE of the island. Pea Point Light is shown from a white square tower on the corner of a white square building, 8m high, on the point.

Roaring Bull, a rock which dries 7m and is marked by a light, lies about 275m WNW of Pea Point, on the E side of the entrance channel to Letang Harbor.

Green Islet, 6.1m high, on the W side of the entrance, lies about 0.8 mile SW of Pea Point, near the outer end of a ledge extending from the E side of Bliss Island. A shoal, with a depth of 8.2m and marked by a buoy, lies ESE of the islet. It should not be passed within 0.1 mile on its E side.

Colt Rock, which dries 3.7m, lies on the W side of the entrance, about 0.5 mile WSW of Pea Point. Mare Rock, which dries 3.7m, lies about 0.1 mile N of Colt Rock. Mink Island, 6.1m high, lies about 275m WNW of Mare Rock, to which it is joined by a bank.

**Letang Head** (45°03'N., 66°49'W.), on the E side of the entrance and about 0.8 mile NW of Pea Point, is the W

extremity of a peninsula, 60m high, separating Blacks Harbor from Letang Harbor.

Blacks Harbor, S of the peninsula, provides temporary anchorage for small vessels W of a 1.8m rock, located about 0.5 mile within the harbor. An L-shaped ferry wharf, 122m long, with a depth of 4.6m alongside, lies close within the entrance and on the S side of the harbor.

A patent slip and marine railway with repair facilities is situated on the NW side of the harbor. The length of the cradle is 24m and it can accommodate vessels of up to 24m in length, 6m breadth, and a maximum draft of 3.4m, with a lifting capacity of 60 tons. There is a refitting berth, which dries, adjacent to the slip.

McCann Island, 29m high, lies about 0.2 mile SW of Letang Head, on the W side of the entrance to Letang Harbor. Drying ledges extend from about 0.1 to 0.2 mile N of the island.

Kings Point, the S extremity of Letang Peninsula, lies about 0.7 mile N of Letang Head.

Letang Harbor lies SW and E of Letang Peninsula and provides good anchorage anywhere. A good anchorage for small vessels is in 14.6m, mid-channel, about 0.5 mile ENE of Kings Point.

## Bliss Harbor

**1.32 Bliss Harbor** (45°02'N., 66°51'W.) is entered between **White Head Island** (45°01'N., 66°52'W.) and the SW end of Bliss Island. White Head Island, 33m high, wooded with steep cliffs, is steep-to on its S side. Bliss Island Light marks the SW extremity of Bliss Island. A lighted bell buoy is moored about 275m SW of the light. Shoals in the area, including one about 0.5 mile W of Bliss Island Light, with a least depth of 6.4m, can best be seen on the appropriate chart.

Man of War Island, about 0.7 mile NE of White Head Island, lies in the SW entrance to the harbor. Man of War Rock, which dries about 3.7m, and from which drying ledges extend about 275m S, lies about 0.1 mile SE of Man of War Island. A buoy marks the S end of these ledges and a buoy marks the E side of Man of War Rock. Boat Rock, above-water, lies about 0.1 mile N of Man of War Island, to which it is almost joined by rocky ledges.

Flea Island, about 0.8 mile NE of Man of War Island, is the S of three islands, which with McCann Island, about 0.3 mile W, separates Bliss Harbor from Letang Harbor.

**Anchorage.**—Vessels can anchor in about 11.9m out of the strong tidal currents, about 0.3 mile WSW of Flea Island. Smaller vessels can anchor in 14.6m in the entrance to Fisherman Cove, a bight formed in Bliss Island, about 0.5 mile SE of Man of War Island.

Vessels proceeding to Letang Harbor steer to pass S of Flea Island, remaining clear of a 5.5m patch, about 137m S of that island. Then steer to pass about 0.1 mile SE of McCann Island.

## Letang Harbor to Point Lepreau

**1.33 Deadman Head** (45°02'N., 66°47'W.), about 1 mile E of Peg Point, is the W extremity of a narrow peninsula. The W entrance point of **Beaver Harbor** (45°04'N., 66°44'W.) lies about 2.3 miles E of Deadman Head. The intervening shore is steep-to except about midway, where a shoal on which there is an islet and a reef extends about 275m offshore.

Drews Head (Lighthouse Point), nearly 0.5 mile NE of the W entrance point, is marked by a light shown from a white circular tower. A lighted bell buoy is moored about 0.7 mile SSE of Drews Head Light.

A rock, with a depth of 2.9m, lies 0.35 mile NE of the light. Another rock, with a depth of 4m, lies about 0.1 mile NE of the same light.

The village of Beaver Harbor is situated on the W shore of the harbor, about 0.5 mile NNW of Drew Head. There are two public wharves in the village. The S wharf and larger being 133m long with a depth of 2.7m at the outer end; the outer 70m of the NW side is dredged to a depth of 5.5m, but there are lesser depths in the approach to the berth. Close W of the S wharf, the other public wharf has an outer section 61m long with a depth of 1.8m at the outer end.

To the NW, the outer face of the fish plant wharf is 40m long, with a least depth of 1.8m alongside. A submarine pipeline extends about 150m NE.

**Anchorage.**—Small vessels with local knowledge will find secure anchorage in 4.6m, off the village, about 0.5 mile N of Drews Head.

Seely Cove (Seeleys Cove) lies close N of Sealy Head, about 3.5 miles ENE of Beaver Harbor. A lighted bell buoy is moored about 0.5 mile S of Sealy Head. Good anchorage for mariners with local knowledge lies close N of Sealy Head, in depths of 9.1m, sheltered from SW winds. Rocks, which dry, extend about 0.2 mile S from the N entrance point of the cove.

**Red Head** (45°06'N., 66°35'W.), about 3 miles farther ENE, is a wooded headland with steep cliffs, 68m high.

Maces Bay lies between Red Head and Point Lepreau, about 5.8 miles ESE. There is anchorage for mariners with local knowledge in the W part of Maces Bay.

Pocologan Islet lies about 0.6 mile NE of Red Head. Mink Ledge, about 0.3 mile ENE, has a small portion of its SE end always above water. A 6.4m patch lies about 275m E of the SE end of the ledge.

**Barnaby Head** (45°07'N., 66°32'W.) is the W entrance point of Lepreau Harbor, the NE extension of Maces Bay. Mink Island, 32m high, lies about 0.5 mile W of Barnaby Head. A lighted bell buoy is moored about 0.4 mile S of Barnaby Head.

Lepreau Harbor, entered between Barnaby Head and Ragged Head, about 1 mile ENE, provides anchorage for small vessels with local knowledge in depths of 5.5m. Close inside Ragged Head, there is a government wharf 99m long and 12m wide at the outer end, with a depth of 1.5m alongside. A slip is situated on the E side of the pier.

**Point Lepreau** (45°04'N., 66°28'W.), the E entrance point of Maces Bay, is marked by a light, shown from a red and white horizontally banded octagonal tower. A lighted whistle buoy is moored about 1 mile S of the point. The E shore of Maces Bay, N of the point, consists of steep cliffs.

A 44m concrete dome of a nuclear power plant is situated on Point Lepreau. A microwave tower stands at an elevation of 60m, about 2.5 miles N of the point.

Lepreau Ledges (Maces Bay Ledges), upon which there are several islets, extend about 1.8 miles SSW from a position 3 miles N of Point Lepreau. A lighted bell buoy is moored about 0.2 mile SW of the ledges, and about 2 miles NW of Point Lepreau.

The Brothers (Salkeld Islands) are two islets NW of Lepreau Ledges. The larger islet is 23.8m high. A shingle bar, which dries, extends nearly to the shore, about 1.3 miles ENE.

The E side of Barnaby Head, bearing 354° and open W of The Brothers, leads W of Lepreau Ledges.

Little Lepreau Basin, a narrow inlet, almost dry at LW, lies about 4 miles N of Point Lepreau. A breakwater-wharf, about 0.7 mile S of the entrance to the basin, has a depth of 2.7m at the outer end.

## Point Lepreau to Saint John Harbor

**1.34 Dipper Harbor West** (45°06'N., 66°25'W.) (World Port Index No. 6560) is entered between Fishing Point, a bold point about 2.8 miles NE of Point Lepreau, and Campbells Point, the S point of a peninsula, 23m high, about 0.4 mile NNE. A lighted bell buoy is moored about 0.5 mile ESE of Fishing Point. Dipper Ledges, which dry 6.1m, lie about 0.2 mile ENE of Campbells Point.

At the village of Dipper Harbor West, on the S side of the harbor, there is a breakwater-wharf, 88m long, with depths of 1.5 to 3.4m alongside the outer 60m.

Little Dipper Harbor, about 2 miles ENE of Campbells Point, is suitable only for small craft; the entrance is obstructed by ledges and rocks. Foul ground, on which there is a rock, 2.4m high, extends almost 0.5 mile ESE of the SE entrance point.

Chance Harbor, open SE, is entered between **Reef Point** (Lighthouse Point) (45°07'N., 66°21'W.) and Cranberry Head, about 0.8 mile ENE. Chance Harbor Light is shown from a circular tower, with red and white bands, on Reef Point. A lighted bell buoy is moored about 0.8 mile ESE of Reef Point.

Mann Rock (Dry Ledge), 5m high, lies about 0.5 mile SW of Reef Point, and is almost joined to the mainland by rocks and ledges, some of which dry. Rocks, above-water and awash, extend about 0.1 mile E of the same point and are marked by a buoy.

Mawhinney Rock, which dries 1.7m and exhibits a radar reflector, lies about 0.4 mile N of Reef Rock. Half Tide Rock, on the E side of the harbor, lies about 0.3 mile ENE of Mawhinney Rock.

A breakwater-wharf, 132m long, with a depth of 2.4m at the outer end, which is 12m wide, lies about 0.3 mile NW of Reef Point.

**Anchorage.**—There is anchorage for small vessels in about 5.5m, in the inner part of Chance Harbor.

Haleys Cove and Little Musquash Cove, about 0.5 mile and 1.8 miles ENE of Cranberry Head, respectively, provide temporary anchorage, sheltered from N winds, to small vessels. Pork Ledge, a drying flat with a small islet, extends about 275m S of the E entrance point to Haleys Cove.

**1.35 Musquash Harbor** (45°09'N., 66°15'W.), the estuary of the Musquash River, is entered between Western Head and Musquash Head, about 0.5 mile E. The harbor is open S, and is available only to small vessels. Gooseberry Island, 21.3m high, lies about 0.3 mile SW of Western Head. A rock, awash, and marked by a lighted bell buoy, lies about 138m E of Western Head. Split Rock, 7.6m high, lies close to the shore, about 1 mile E of Musquash Head.

Musquash Light is shown from a white tower with a red horizontal band on Musquash Head.

**Split Rock** (45°08'N., 66°13'W.), 8m high, lies close S of a point lying about 0.9 mile E of Musquash Head. Tide rips extend about 0.1 mile S of Split Rock.

**Tiner Point** (45°09'N., 66°12'W.), on which stands a white rectangular building, lies about 1.3 miles NE of Split Rock. A chimney, 192m high and marked by white strobe lights, lies about 0.4 mile WSW of Tiner Point.

The coast continuing NE to **Negro Head** (45°11'N., 66°09'W.), 41m high, is bold, cliffy, and wooded. A rock, with a depth of 1.8m and marked close NE by a lighted bell buoy, lies about 0.3 mile NE of Negro Head.

A conspicuous radio tower, 196m high and marked by red obstruction lights, is situated nearly 2.5 miles NW of Negro Head.

**Lorneville Harbor** (45°12'N., 66°09'W.) is entered between Lorneville Point, located about 0.5 mile N of Negro Head, and Seely Point, the S extremity of a peninsula about 0.8 mile NNE. A breakwater extends 162m N of Lorneville Point. A landing platform, about 43m long, on the W side of the breakwater, has a depth of 4.6m alongside at HW. Most of the harbor dries at LW.

The coast between **Seely Point** (45°12'N., 66°08'W.) and Sheldon Point, about 2.3 miles NE, recedes forming a bight. Two coves, separated by a headland 35m high, lie at the head of the bight. Radio towers, with elevations of up to 116m, are situated about 0.5 mile NW of Sheldon Point.

Manawagonish Island, 30m high, lies with its N end about 1 mile SSW of Sheldon Point. Thumb Cap Island, 11m high, lies about 0.2 mile N of the island. A reef, which dries and on which there is a rock drying 8.5m, extends about 0.2 mile SW of Thumb Cap Island. These islands are joined to the coastal bank, about 0.5 mile W of Sheldon Point, by a bank with a least depth of 3.4m. Temporary anchorage can be taken between Manawagonish Island and the mainland W.

A chimney, 192m high, is situated 1.5 miles ENE of Musquash Light.

## Saint John Harbor (45°16'N., 66°03'E.)

World Port Index No. 6550

**1.36 Saint John Harbor**, at the mouth of the Saint John River, is open to shipping all year. It is important as a winter port when the St. Lawrence River is obstructed by ice. Saint John is the most important commercial center in New Brunswick and carries on a considerable trade with all parts of the world. A sugar refinery, oil refinery, pulp and paper mills, and other industries are situated in the Saint John area. The area consists of four sections: Saint John, on the peninsula Courtenay Bay from Saint John River; East Saint John, E of Courtenay Bay; West Saint John, W of the harbor entrance; and Lancaster, W of West Saint John.

Saint John River is the largest river flowing through the Province of New Brunswick, and is navigable for small craft as far as Fredericton, the capital of the province.

**Traffic Separation Scheme.**—For vessels approaching or departing from Saint John Harbor, there is a traffic separation

scheme situated about 15 miles SSW of Partridge Island, in use in the approaches to the pilot boarding station. Its use is compulsory for all ships of 20m in length or more, during both day and night, and in all weather conditions. The International Regulations for Preventing Collisions at Sea must be observed at all times while using the Traffic Separation Scheme.

## Winds—Weather

During the winter months, the prevailing winds are from the NW. From April through August, winds are usually from the SE, S, and SW. Gales occur in winter and early spring.

Fogs are rather frequent, particularly in the early part of the day, from the middle of June to the end of August. November and December have the least fog.

## Ice

Due to the large tidal range in Saint John Harbor, it is stated that the formation of ice in the harbor is almost impossible and that field ice never drifts into the entrance of the harbor from the Bay of Fundy. The ice which does form in the Saint John River terminates 3 miles above **Reversing Falls** (45°15.7'N., 66°05.3'W.), at the head of harbor, and is prevented by them from escaping into the harbor. When the ice does break up in the spring, it is rotten and completely pulverized when coming down over the falls.

## Tides—Currents

Saint John Harbor is noted for extremely high tides, strong tidal currents, and significant currents caused by the outflow from the Saint John River through the harbor and its approach channels, especially during the spring freshet in April and May. At spring tides the range is about 8.8m.

There is a conflict between the strong tidal currents and the river current; when the river is high, the current is stronger and lasts longer against a flood tidal current. The river normally rises 24 hours after a heavy rain, and it is at its highest during the spring freshet. East winds reduce the effect of ebb tidal currents and increase the amount of salt water entering the harbor during the flood current.

During the spring freshet, the great volume of water discharging from the river causes a constant outgoing surface flow to a considerable depth, which at times attains a velocity of 5 knots in the main harbor. When these conditions prevail, vessels entering or departing from Courtenay Bay may be restricted to a maximum draft of 8.5m and daylight movements only.

Even with normal conditions, because of the outflow from the river, the surface flow may be misleading with a rising tide. After half tide, rising, an outward surface flow may still be very evident, while underneath but coming nearer the surface as the tide continues to rise, a strong inward current may exist. From approximately half tide, falling, the whole movement of the water is outward.

The following conditions were observed in the channel opposite **Negro Point** (45°15'N., 66°04'W.), in the month of August with tides of average range: At a depth of 6.1m, the flood tidal current began 3 hours after LW, and the ebb current about 2 hours 30 minutes after HW. On the surface the ebb rate

rose to 2.5 knots, and the flood rate to 1.75 knots; at a depth of 3m, the rates were 1.5 knots and 1 knot, respectively.

**Density Current.**—The hydraulic conditions in Saint John Harbor can best be described as a wedge of salt water that advances and recedes beneath the river water under the influence of the tide. There is a clearly defined layering of water throughout the area, forming an interface between the two bodies of water. With the difference in the relative density of each layer, mixing between them will occur. As the deeper and denser salt water mixes upward into a fresher layer, it is carried outward and the water thus lost is replaced by more inflowing deep water. This is known as a density current, an undercurrent that has been recorded to be as high as 1.8 knots.

At HW the entire movement is inflowing. While at half tide falling, after the change in flow at Reversing Falls, the entire water movement is outward.

Mixing of salt and fresh water occurs in the main harbor and carries on upstream through the Reversing Falls. At the entrance to **Courtenay Bay** (45°15'N., 66°03'W.), a complex circular motion of water exists. There is a minimal flow of fresh water into the bay, and as a result the density current is not as strong as in the main harbor. These conditions vary somewhat during the freshet.

**Salinity.**—The salinity of the water in the harbor varies with the state of the tide. During the spring freshet, the water in the main harbor is almost all fresh.

## Depths—Limitations

The channel into the main section of Saint John Harbor is 183m wide and has depth of 8.2m along the range line. It was reported in 1994 that the depth in the channel was 9.1m. The channel leading into Courtenay Bay lies to the W of the breakwater and has a depth of 5.3m along the range line. Lesser depths occur along the sides of both channels. The channel to Courtney Bay has a minimum width of 152.2m.

Small vessels and small craft proceeding beyond the head of the harbor and farther up the Saint John River will encounter a road bridge, with a vertical clearance of 23m, close W of Navy Island Terminal and a road and rail bridge at Reversing Falls, with a vertical clearance of 24m.

The following port facilities are available at Saint John:

Location	Length	Depth	Remarks
<b>Main Harbor-West Side</b>			
1A	188m	10.4m	Ro-ro, forest products
1B	188m	10.4m	Ro-ro
2A	152m	10.4m	Bulk grain
2B	160m	10.4m	Bulk grain
2C	91m	8.2m	Bulk grain
3A	152m	10.4m	Bulk grain
3B	160m	10.4m	Bulk grain
Rodney A	295m	12.2m	Containers
Rodney B/C/D	606m	12.2m	Containers
11	134m	9.1m	



Location	Length	Depth	Remarks
12A	131m	9.1m	
12B	134m	9.1m	
13A	122m	9.1m	Closed to vessel traffic
13B	122m	9.1m	Closed to vessel traffic
14A	122m	9.1m	Closed to vessel traffic
14B	122m	9.1m	Closed to vessel traffic
<b>Main Harbor-East Side</b>			
Long Wharf A	189m	9.1m	
Long Wharf B/C	280m	10.7m	
Pugsley North	92m	10.7m	
Pugsley A/B	297m	10.7m	
Pugsley C	232m	10.7m	
Lower Cove	245m	11.0m	Ro-ro
<b>Courtney Bay</b>			
Barrack Point	245m	13.0m	Potash
Broad St. A	137m	6.7m	
Broad St. B	137m	6.7m	
<b>Private Wharves</b>			
Atlantic Sugar	134m	9.1m	Bulk sugar unloading terminal with a sugar refinery.
Canadian Coast Guard Wharf	165m	6.8m	
Ministry of Transportation	407m	7.0m	
CN Marine	253m	6.7m	
Rothsay	168m		
Irving Oil 1	198m	12.2m	Used to discharge oil. Maximum draft is 11.5m subject to tide. Maximum length 213m.
Irving Oil 2	102m	7.6m	
Irving Oil 4	183m	10.7m	

The largest drydock has a length of 427m, a width of 38m, and a depth of 13m over the sill. When needed, this drydock can be lengthened.

**Note.**—Due to continuous silting in the harbor, the dredged depths are subject to change. The main harbor channel has required little dredging in the past; however, silting is a more serious problem in Courtenay Bay, where maintenance dredging is usually done annually. With the exception of the

dredged portions, Courtenay Bay is entirely occupied by sand and mud flats which dry.

The bridge across the Saint John River, above the main harbor, has a clearance of 23m. Fixed white lights are fitted on the two bridge piers, one on each side of the channel, visible from both directions.

## Aspect

**Inner Approaches to Saint John.—Partridge Island** (45°14'N., 66°03'W.), about 2 miles ENE of Sheldon Point, is 24m high and surrounded by reefs and shoals extending to about 275m NE of the island. A light is shown from the highest part of the island and a monument is conspicuous about 0.1 mile SSW of the light.

**Negro Point** (Negrotown Point) (45°15'N., 66°04'W.), the SE point of West Saint John, lies about 0.5 mile NNW of Partridge Island, to which it is connected by a breakwater.

Between Negro Point and Sheldon Point, about 2 miles SW, a coastal bank, with depths of less than 5.5m, extends about 0.8 mile from the shore. Shag Rocks, one of which is 1.2m high, lie on this bank, about 1 mile W of Partridge Island.

The entrance channel to Saint John Harbor lies E of Partridge Island and is buoyed. Range lights, in line bearing 333.5°, lead into Saint John Harbor.

Courtenay Bay lies between Red Head and Saint John Peninsula. A breakwater extends about 1 mile SSW from the NE side of the bay, about 1.3 miles NNW of Red Head. The dredged channel into Courtenay Bay lies W of the breakwater and is marked by buoys; a directional light marks the outer portion of the dredged channel. Courtney Bay range lights, in line bearing 021°, are shown from the E side of the bay. Each light is shown from a skeleton tower with a fluorescent red daymark having a black vertical stripe.

Three conspicuous chimneys, each 110m high, painted in red and white horizontal bands, are situated about 1.3 miles NE of the head of Courtenay Bay Breakwater. There are two conspicuous red cranes in the dry dock area to the W of these chimneys.

An Atlantic Sugar Refineries plant is conspicuous about 0.7 mile NW of the latter breakwater head. The Armories are situated about 275m NW of the sugar refinery building.

In West Saint John, the Canadian Pacific Railway elevator, 64m high, is conspicuous about 0.8 mile W of the same breakwater head. The National Harbour Board grain elevator is conspicuous about 0.3 mile farther NW.

## Pilotage

Pilotage is compulsory. The pilot boarding station is at 45°10.8'N, 66°03.7'W, about 3.5 miles S of Partridge Island. The pilot vessel (black hull with white band and white deckhouse, 19m long) is equipped with radar, VHF radiotelephone, and radiotelegraph. Channel 12 is guarded when underway. Also available is Halifax Marine Radio Station (call sign VCS) and Coast Guard Traffic Center on VHF channel 12, 14, and 16.

To avoid delay in obtaining a pilot, masters of vessels bound for Saint John, N.B., must report via any coastal radio station their ETA to Pilots, Fundy Traffic, Saint John, 12 hours before arrival at the pilot boarding station. The time used must be



### Saint John Harbor—Forest Products Terminal

GMT. The ETA must be confirmed or corrected 4 hours before arrival at the pilot boarding station.

The master of a vessel that is to depart or move within the compulsory pilotage area must report to Pilots, Fundy Traffic, Saint John, 4 hours before the ETD. Local time should be used. If GMT is used it must be expressly stated.

A large fleet of tugs operate within the port. The use of tugs is compulsory for berthing and unberthing at Canaport Oil Terminal. The use of one or more is recommended when berthing and unberthing in other parts of the harbor.

**Vessel Traffic Service.**—A VTS center at Saint John administers a mandatory system for all vessels 20m in registered length or more. Vessels of less than 20m in length are encouraged to maintain a listening watch on the appropriate VTS channel when navigating in the Fundy Zone.

### Regulations

Vessels maneuvering or otherwise underway in Saint John Harbor, and also while at an alongside berth or at anchor, are subject to the Saint John Port Corporation By-Law "Operating Regulations". A copy of these regulations may be obtained from the corporation. The harbor limit extends across the entrance to the harbor, 0.5 mile S of Musquash Head.

These Operating Instructions require that no vessel shall move in a harbor at a rate of speed that may endanger life or property.

The port corporation has wide powers over vessels in its harbors, and may order vessels to move, to use tugs, to berth or anchor in locations which it designates. Certain restrictions on berthing and anchoring are set forth, along with the

requirements for vessels to inform the port in advance of their intention to berth or anchor in the harbor.

Vessels are regulated with respect to cargo-handling operations, and the equipment and lighting employed in these operations. Instructions for signalling, action in the event of accidents, cargo or gear lost overboard, and safety requirements are included.

There are specific vessel regulations for the carriage and handling of explosives and dangerous goods, as well as rules to be observed in the prevention of fire.

Due to tidal conditions in the harbor, the average ship's gangway is not long enough and a longer one may be rented from the port corporation.

### Signals

Vessels requesting pilots should show the International Signals required for pilots by day or night. In abnormal weather such as fog, snow, or heavy rain, the vessel requesting a pilot should, in addition to the regular signals, sound four long blasts, at intervals until the pilot vessel is situated. The pilot vessel will, in addition to the regular signals, sound four short blasts at intervals.

### Anchorage

Anchorage "A," "B," and "C" are centered 2 miles SSW, 3.5 miles SSW, and 4.25 miles SSE, respectively, of Partridge Island. Permission should be obtained from the Canadian Coast Guard Traffic Center (Fundy Traffic) prior to anchoring in any of the areas identified.

A continuous VHF listening watch on channel 12 should be maintained by vessels at anchor, in compliance with the Coast



**Saint John Harbor—Coast Guard Wharf (foreground) and Pugsley Wharf from N**

Guard Traffic Center. Vessels should be ready to proceed or maneuver on short notice.

Herring purse seining operations are conducted in area "A" from November 1 to April 1. Vessels should exercise caution and avoid fouling nets.

### **Caution**

A line consisting of foam and small bits of debris stretches across the approaches to Saint John Harbor. Its location changes with the state of the tide, but it should be the most visible at half flood tide before SW at Reversing Falls.

On the outside of this line, the seawater is slightly tainted in color with the yellowish green tinge of fine sandy particles held in suspension. The fresher surface water on the inside is deep brown in color.

### **Saint John River**

**1.37 Reversing Falls** (45°16'N., 66°05'W.), at the head of Saint John Harbor, lead to the upper reaches of the Saint John River. This remarkable phenomenon is caused primarily by a ridge of rock, with a least depth of 4m at LW, extending across the river. The ridge rises abruptly from the river bed, with deep water on either side, and has a damming effect on the inward and outward flow of the tidal water.

At LW, the surface of the river above the falls is 3.4 to 4.6m above the level of the harbor, and at HW it is 1.8 to 3m below the harbor level. The falls reverse with the tide, but the effect is more marked during the outward flow.

The falls are navigable by small vessels for about 0.5 hour before and after SW, which lasts about 10 minutes. Small boats should pass during the period of SW. During great freshets, due

to the melting of the snow, which usually occurs between the beginning of April and the middle of May, the falls are impassable as the harbor level never reaches that of the river. Meteorological conditions can alter the time of LW or HW from that predicted by an appreciable amount.

There is no requirement to contact the port corporation when berthing to await SW at the Reversing Falls. A temporary berth is available at a pontoon adjacent to the Market square complex, close N of the Canadian Coast Guard wharf. The pontoon is 30m long, but it is reported that the inner 9m has depths of only 0.6 to 0.9m alongside.

The river above the Falls is navigable as far as **Fredericton** (45°57'N., 66°38'W.), about 70 miles above Reversing Falls. Kennebecasis Bay and Kennebecasis River join Saint John River about 3 miles above the Falls. The controlling depths in the river are 4.3m to the head of Kennebecasis Bay, and 2.7m to Fredericton.

### Saint John Harbor to Chignecto Bay

**1.38 Red Head** (45°15'N., 66°01'W.), the E entrance point of Courtenay Bay, has steep cliffs about 19.2m high. Cranberry Point, 1 mile SE of Red Head, is about 3.7m high.

**Black Point** (45°13'N., 66°00'W.), about 1.5 miles S of Cranberry Point, is bordered by drying reefs extending about 0.1 mile SSW. A shoal patch, mud, used as a dredged spoils dumping ground and marked close SW by a lighted bell buoy, lies about 0.5 mile SW of Black Point. Mariners are advised to use caution as other unreported shoal depths may lie in this area. A light is shown from a red and white tower on Black Point. A lighted whistle buoy, equipped with a racon, is moored about 1.5 miles W of Black Point.

**Mispic Point** (45°12'N., 65°59'W.), lying about 1 mile SE of Black Point, is a bold projection rising to an elevation of 87m. A tank farm is situated close within the point. A red and white radar tower, 157m high, lies about 1.5 miles N of the point.

**1.39 Canaport** (45°12'N., 65°59'W.) (World Port Index No. 6545) consists of a single point mooring buoy, marked "Irving", which is moored 0.6 mile S of Mispic Point. Submarine pipelines are laid from the buoy to the shore, and the buoy has a 290m free floating discharge hose, whose relative direction to the buoy is dependent on the wind and tidal current. The terminal enables bulk carriers to perform cargo unloading and de-ballasting operations. The depth at the terminal is 37m and tankers of 350,000 dwt, drawing 22.9m, can be accepted.

Currently, there is daylight berthing only, but with no restrictions on departure.

The vessel's ETA at the terminal should be sent via the agent 96, 72, 48, and 24 hours before arrival.

Pilotage is compulsory. Pilots should be requested from St. John 12 hours in advance, and confirmed or corrected 4 hours prior to arrival. The pilot will board 3.25 miles WSW of the terminal, in the same position as for Saint John harbor. Vessels waiting to berth should anchor in Anchorage C, south of 45°10'N.

Mispic Bay is entered between Mispic Point and Connolly Head, 30.5m high, about 1.5 miles ESE. The bay is open to the S and affords little protection; however, anchorage is available in depths of 7.3 to 9.1m. Black Rock, 3m high and steep-to, lies about 0.5 mile S of Connolly Head.

**1.40 Cape Spencer** (45°12'N., 65°55'W.), in the E approach to Saint John, about 2.3 miles SE of Connolly Head, is high, bold, and wooded. A light is shown at an elevation of 64m from a red and white circular tower on Cape Spencer.

**Caution.**—There is a strong tide rip off the cape with a W wind and a W tidal current. Vessels should pass S of the cape in order to avoid this tide rip.

The coast from Cape Spencer to Cape Enrage, about 54 miles ENE, on the NW side of Chignecto Bay, is bold, thickly wooded, and from 122 to 274m high. It is intersected by numerous valleys, through which small rivers enter the Bay of Fundy. The mouths of the small rivers are very similar in appearance, being composed of bars of shingle and gravel, with a narrow passage on one side through which small vessels may enter at HW and berth on the mud, generally sheltered from all winds; however, local knowledge is required.

During the summer months vessels may anchor, at a reasonable distance offshore, anywhere between Cape Spencer and Cape Enrage.

**McCoy Head** (45°15'N., 65°44'W.), a rounded headland, 61m high, and covered with trees, lies about 8 miles ENE of Cape Spencer. The coast between the two points recedes forming a bight with Black River at its head. A government pier, near the E entrance point of the river, is 50m in length, extending to a depth of 7.6m at HW.

The shore between Cape Spencer and Black River is steep-to, except in the vicinity of a point, about 2.5 miles ENE of the former, from which drying rocks extend about 0.1 mile offshore.

The Sisters consist of a small group of rocks 0.6 mile offshore, about 2 miles W of McCoy Head. The outer rocks dry about 3.4m, but the inner rock, about 0.1 mile nearer the coast, from which it is separated by a deep-water channel, only shows at LW. A lighted bell buoy is moored close S of The Sisters.

**East Red Head** (45°17'N., 65°41'W.), about 2.5 miles ENE of McCoy Head, is composed of red cliffs about 15.2m high. Rogers Head, about 5 miles farther ENE, is 122m high, thickly wooded, and steep-to, with high perpendicular cliffs on its W side and a steep slope on its S side.

**Caution.**—A submarine telecommunications cable is laid from the shore W of Rodgers Head and extends SE to the SE shore of the Bay of Fundy, in the vicinity of Port George.

**1.41 Quaco Head** (45°19'N., 65°32'W.), 76m high, lies about 2 miles NE of Rogers Head, from which it is separated by a treeless valley. There is a tide rip off Quaco Head. Quaco Head Reef, on which there is an above-water rock, extends about 0.5 mile SE of Quaco Head. A light is shown from a white square tower at the corner of a white square building situated on Quaco Head. A lighted bell buoy, which is withdrawn during the winter, is moored SE of the reef.

A depth of 16.5m lies about 2 miles SE of Quaco Head.





### Cape Chignecto

Quaco Shoal, with a least depth of 1.8m, lies from about 0.5 to 1.5 miles NNE of Quaco Head. The S and W ends of the shoal are marked by buoys.

**Quaco Bay** (45°19'N., 65°32'W.) is entered between Quaco Head and Macomber Point, 2 miles NNE. The mouth of the Irish River, protected by two small breakwaters and accessible by coasting vessels to which it provides shelter, lies 0.7 mile W of Macomber Point, with Macomber Creek between.

There is an alongside public pier close N of the mouth of the Irish River, with the outer face 70m long and depths of 1.5 to 2.4m alongside at HW.

**Anchorage.**—Good temporary anchorage for mariners with local knowledge can be taken in depths of 9.1 to 11m, sheltered from N and W winds, about 0.5 mile NE of McCoy Head, with East Red Head in line with Rogers Head. Anchorage is also available in depth of 9.1 to 11m, mud, between Quaco Shoal and the head of the bay, about 1 mile N of Quaco Head, but this anchorage is unsafe with E winds.

**Off-lying Danger.**—**Quaco Ledge** (45°14'N., 65°22'W.), about 8.8 miles ESE of Quaco Head, consists of a small ridge of rocks surrounded by deep water. The highest part of the ridge dries 4m, and when covered, shows a heavy tide rip. In the vicinity of Quaco Ledge, the tidal currents set parallel to the coast with a maximum velocity of about 2 knots. A lighted bell buoy is moored about 230m NW of the ledge.

**Fownes Head** (45°23'N., 65°27'W.), about 5 miles NE of Quaco Head, can be distinguished by its perpendicular red cliffs, 91.4 to 122m high.

The entrance to the Salmon River, about 3.3 miles farther NE, is protected by two breakwaters. A shoal, with depths of 9.1m and less, extends about 1.3 miles S of the mouth of the river.

Tufts Point, about 1.5 miles farther NE, is an earthy headland, 9.1 to 15.2m high, and partly cleared.

**Martin Head** (45°29'N., 65°11'W.), about 8.5 miles ENE of Tufts Point, is a small, bare hillock, 30.5m high, connected to

the mainland, about 0.5 mile WNW, by a gravel and sand causeway. Martin Head, when seen from a distance, resembles an island. A patch of rocks, which dry 1.5m, lies about 0.3 mile WSW of the head.

**Tides—Currents.**—Between Cape Spencer and Martin Head, the tidal currents run parallel to the coast at an average rate of 2 knots. In the vicinity of Cape Spencer, the W current commences about 2 hours before HW, and the E current 2 hours before LW by the shore.

### Chignecto Bay

**1.42** Chignecto Bay lies between New Brunswick and Nova Scotia, and is entered between Martin Head and Cape Chignecto, about 14 miles SE. Cape Chignecto is a steep-to, bold, conspicuous headland. The land near the cape rises rapidly to over 213m. The bay is free from off-lying dangers, and even in thick weather the gradual decrease of soundings on either side is sufficiently defined to insure safe navigation to within 5 miles of **Cape Maringouin** (45°43'N., 64°33'W.), where the head of the bay shoals before branching into Shepody Bay and Cumberland Basin.

**Anchorage.**—A dangerous wreck lies about 1.2 miles NW of Cape Chignecto.

**1.43 Northwestern Shore.**—**Matthews Head** (45°34'N., 64°58'W.), about 10.5 miles ENE of Martin Head, is a bold and rounded point, 46m high, partially cleared of trees. A thickly wooded hill rises to an elevation of about 213m close behind the point.

The entrance to Upper Salmon River, which dries, lies about 2 miles NNE of Matthews Head. At the mouth of the river there are two breakwaters and close within is spanned by a road bridge, vertical clearance 1.5m, at the resort village of Alma which lies on the E bank. The river and its approaches dry for a distance of more than 0.5 mile offshore. A lighted buoy is moored about 0.6 mile SE of the entrance. A channel

marked by stakes leads through the drying bank in the approaches to the entrance where a light stands on the head of the NE breakwater at Alma. A tide gauge, with a radar reflector, stands about 0.6 mile SSW of the NE breakwater, on the drying flats W of the approach channel.

Three radio towers, 61m high and fitted with red aircraft obstruction lights at an elevation of 347m, are situated about 3.3 miles N of the river entrance. Owls Head, a thickly wooded point, lies about 1.8 miles farther ENE.

There is a berth alongside the NE breakwater, 70m long with depths at the outer end of 3.4m and 4.9m, respectively, at HW neap and spring tides.

Salisbury Bay (Rocher Bay) is entered between Owls Head and **Cape Enrage** (45°36'N., 64°47'W.), which is thickly wooded and faced with perpendicular cliffs, 30.5m high. A rocky spit, which dries, extends nearly 0.3 mile SSW from the cape, and a lighted bell buoy, which is not maintained during the winter months, is moored about 0.6 mile SW of Cape Enrage Light.

Red Head, composed of earthy cliffs, 15 to 30m high, is located near the head of Rocher Bay, 3 miles NW of Cape Enrage. Tidal currents generally set towards Cape Enrage. A depth of 6.4m lies about 2.5 miles SW of Red Head. The bay is not recommended as an anchorage, being shallow towards its head and entirely open to the prevailing S and W winds.

**Marys Point** (45°43'N., 64°39'W.), the S entrance to Shepody River, lies about 9.5 miles NE of Cape Enrage. New Horton Flats, which dry 6.7m, fill the bay between Marys Point and the coast SW.

Marys Point Reef (St. Mary Ledge), which dries 8.5m, extends about 0.6 mile NE of Marys Point.

Grindstone Island, 36m high, on which there are several abandoned grindstone quarries, lies about 1 mile ENE of Marys Point. A light (white 6-sided tower, 6m high) stands near the W end of the island. Grindstone Shoal, with a least depth of 2.7m, lies with its N end about 0.3 mile SSE of Grindstone Island, and extends about 1.3 miles SSW. The N and S ends of the shoal are marked by buoys.

**Tides—Currents.**—The tidal rise at Grindstone Island is 11.9m at MHWS, and 10.4m at MHWN. The tidal currents between Martin Head and Grindstone Island run parallel to the shore with an average velocity of 2 knots, and cause eddies near the projecting points.

Anchorage between Martin Head and Grindstone Island can be taken anywhere along the shore in good weather, but with winds of any strength these anchorages become insecure.

**1.44 Southeastern Shore.**—The coast from **Cape Chignecto** (45°20'N., 64°57'W.) to Squally Point, about 6.3 miles N, is steep-to. From Squally Point to Pudsey Point, about 2.8 miles NE, the coastal bank, with depths of less than 5.5m, extends up to 0.5 mile offshore. Duden Rock lies on this bank, about 0.2 mile NE of Squally Point.

Apple River, which dries across just above its entrance, is entered between Pudsey Point and **Cape Capstan** (45°28'N., 64°51'W.), about 0.8 mile NNE. Apple River Light is shown on Cape Capstan from a white square tower on the corner of a white square building.

The coast between Apple Head, about 1.5 miles NE of Cape Capstan, and Raven Head, about 10.5 miles farther NE, recedes forming a bight. From a position close NE of Raven Head to **Ragged Reef Point** (45°40'N., 64°30'W.), the coastal bank, with depths of less than 5.5m, extends about 0.3 mile from the shore. A lighted bell buoy is moored about 1 mile WSW of Ragged Reef Point.

Between Ragged Reef Point and Boss Point, about 4 miles NNE, the shore recedes forming a bight, the head of which dries out for about 0.5 mile. The village of Joggins is situated near the head of the bight.

**Cape Maringouin** (45°44'N., 64°33'W.) is the SW extremity of the peninsula which divides the head of Chignecto Bay into two branches, the Petitcodiac River to the W and Cumberland Basin to the E. A bank, with depths of less than 5.5m, extends about 1.5 miles S of the cape. Maringouin Shoal, with a least depth of 0.3m, lies about 1.5 miles SE of the cape, on the E part of the latter bank.

## Petitcodiac River

**1.45** Petitcodiac River is navigable at HW, as far as **Moncton** (46°05'N., 64°46'W.), about 24 miles above Cape Maringouin.

Tidal currents in Shepody Bay, in the entrance to the river, have a maximum velocity of from 3 to 4 knots. Tide rips extend from the vicinity of Grindstone Island in a NNE direction for a distance of about 5 miles.

The Petitcodiac River is noted for its bore, which occurs between Stoney Creek, about 9.5 miles above Fort Folly Point, and Moncton. The bore, with a breaking face, occurs in this section of the river about 3 hours before HW. At Moncton, its rate of progress at spring tides is about 8 knots, and the average height about 1m. After the bore's passage, the tide rises very rapidly until HW. The breaking face of the bore is only a few inches high at neap tides.

The outer edge of drying flats, in the NW part of Shepody Bay, extend from Grindstone Island to Cape Demoiselle, about 5.5 miles NNE. The latter cape rises to 69.2m, and is the S extremity of Hopewell Cape. Middle Ground, which dries 1.8m, lies with its S end about 2 miles SSE of Cape Demoiselle, and on the W side of the channel to Petitcodiac River.

**Shepody Mountain** (45°48'N., 64°39'W.), 327m high, is the highest point of land along this coast, and is located about 2.8 miles SW of Cape Demoiselle.

Maringouin Flats, which dry 1.2m, lie about 1.3 miles NNE of Cape Maringouin, and extend about 0.8 mile from the shore on the E side of the bay. Grand Anse Ledge, which dries 6.1m, lies about 4 miles N of Cape Maringouin, near the outer edge of the drying flats which fill Grande Anse.

In the main channel there are two shoal patches, with depths of 4.3 and 4.6m, located about 2.3 and 2.5 miles SSE, respectively, of Cape Demoiselle.

**Dorchester Cape** (45°51'N., 64°32'W.), on the E bank of the Petitcodiac River about 7.5 miles N of Cape Maringouin, consist of conspicuous red cliffs, about 30.5m high, which in

good visibility can be seen S of Grindstone Island. Drying rocky ledges extend about 0.4 mile W of Dorchester Cape.

Memramcook River is entered between Cole Point (Cole Head), located close N of Dorchester Cape, and Fort Folly Point, about 0.8 mile W. This river dries about 1.3 miles above its mouth, and local knowledge is necessary for navigating the river.

Close N of Cole Point there is an abandoned concrete pier head, 24m wide, at the face which dries 9.1m.

Calhoun Flats, which dry, extend nearly 0.8 mile E from **Hopewell Cape** (45°50'N., 64°34'W.), about 2 miles N of Cape Demoiselle.

Above Fort Folly Point, the Petitcodiac River winds its way for about 18 miles to the head of navigation at **Moncton** (46°05'N., 64°46'W.) (World Port Index No. 6540), where a causeway crosses the river. At Moncton there is an Irving Oil Company wharf used by small tankers.

**1.46 At Hillsborough** (45°56'N., 64°39'W.) (World Port Index No. 6535), on the W bank of the river, about 4.5 miles above Fort Folly Point, there are the ruins of a pier and gypsum plant, with two conspicuous concrete silos and a water tower adjacent.

On the E side of the river opposite Hillsborough there is a small pier with a depth of 4.9m alongside the outer face at HW. Other berths in the river are in ruins or disused.

Local knowledge is necessary for the navigation of Petitcodiac River. The river dries about 2 miles above Fort Folly Point.

**Anchorage.**—There is anchorage for vessels in about 7.6m, mud, about 0.5 mile W of Fort Folly Point. With the wind opposed to the tide there is a heavy sea in this area.

## Cumberland Basin

**1.47 Cumberland Basin** is entered between **Ward Point** (45°44'N., 64°29'W.), about 2.8 miles E of Cape Maringouin, and Boss Point, about 1.8 miles E. Pecks Point, the inner W entrance point, lies about 1 mile NNE of Ward Point. It is navigable at HW as far as **Sackville** (45°53'N., 64°22'W.) (World Port Index No. 6530), and Amherst Basin, which lie about 12 miles NNE and 12 miles NE, respectively, from Cape Maringouin.

**Tides—Currents.**—The tidal rise at Amherst Basin is 13.6m at MHWS, and 11.9m at MHWN.

In Cumberland Basin, the tidal currents set parallel to the shore with a velocity of 4 to 5 knots.

Cumberland Basin receives the water of several rivers, and is largely occupied by drying flats, but is easily navigable as far as Wood Point, the last treed point on the W shore, about 7.5 miles NE of Peck Point. The narrow and tortuous Tantramar River is entered about 2.5 miles farther NE. Low and marshy land, known as Elysian Fields, extend about 3.8 miles NE of Minudie Point, which lies about 4.5 miles NE of Boss Point.

**Anchorage.**—There is anchorage for small vessels in 11m, about 1 mile NE of Peck Point. Anchorage can also be taken in the narrow channel, about 1 mile NE of Wood Point, in a depth

of about 5 to 7m. Beyond this anchorage vessels have to lie aground at LW.

Local knowledge is required.

## Southwest Coast of Nova Scotia—Cape Sable to Outer Island

**1.48 Cape Sable** (43°23'N., 65°37'W.), the SW extremity of Nova Scotia, is the S end of an island, composed of shifting sand dunes, 4.6 to 9.1m high, almost joined by a sandy beach to Cape Sable Island, close N. Cape Sable Island, flat and wooded, is joined to the mainland N by a causeway. Cape Sable Light is shown from a white octagonal tower on the cape.

From Cape Sable, the coast is indented and trends NW for about 34 miles to Cape Fourchu, the W entrance point for Yarmouth Harbor. Many islands and numerous dangers lie off this part of the coast, the outermost being about 15 miles offshore.

**Tides—Currents.**—West of Cape Sable, the current sets NW on the flood and SE on the ebb.

**Caution.**—Cape Sable often presents a poor radar image. Mariners are cautioned that due to severe storm conditions the shore line in this area is subject to change, and local knowledge is required for navigation in all inshore waters.

Horse Race, an extensive shoal with depths of less than 9.1m, extends nearly 2 miles SSE of Cape Sable. Outer Shoal, with a least depth of 3.7m, is located between 1.25 and 1.75 miles SSE of the cape on this bank.

Columbia Rock, with a depth of 0.9m, lies on the same bank, about 1 mile SSE of the cape. Black Rock, 0.6m high, lies about 0.4 mile E of the E point of Cape Sable.

From Cape Sable, a narrow neck of shifting sand dunes, 4.6 to 8.5m high, extends about 1.5 miles NW to Black Point (Black Head), 3m high. Southwest Ledge, with a least depth of 0.6m, extends 2 miles S from Black Point. There are several drying rocks close N of the ledge, and depths of less than 1.8m between the ledge and Black Point. A bank, with depths of less than 11m, extends about 1.3 miles farther S. At the S tip of this bank, called Tail of the Rip, tidal currents of up to 4 knots have been reported.

A lighted buoy is moored about 4 miles SW of Cape Sable, and about 1 mile SSW of Tale of the Rip.

There are many shoals, with depths of 9.1 to 11m in the general area between Cape Sable Island and Seal Island, about 15.5 miles W.

**1.49 Cornwall Rock** (43°23'N., 65°42'W.), about 2.3 miles SW of Black Point, has a depth of 4.3m and is marked by a buoy. Depths of 7.3m and 7.9m lie about 0.5 mile W and 0.4 mile S, respectively, of the rock.

**Green Island** (43°25'N., 65°41'W.), 6.7m high, about 1.5 miles NW of Black Point, lies on the outer part of a bank, with numerous rocks and ledges extending W from Fish Island.

Green Island Ledge, with a depth of 1.2m and over which there is a tide rip, lies about 1 mile S of Green Island.

Depths of less than 5.5m lie between Cornwall Rock, Green Island Ledge, and Black Point.

Cooks Ledge, with a least depth of 2.7m, lies about 0.8 mile W of Green Island. Doddys Shoal, with a least depth of 7.9m, lies about 0.8 mile farther W.

The common approach to The Sound, Shag Harbor, Bear Point, Newellton, Clarks Harbor, and Barrington Passage lies between Green Island and the S extremity of Outer Island (Bon Portage Island), about 3.5 miles NW.

West Head, the W extremity of Cape Sable Island, is marked by a light shown from a red and white circular tower. Close NE of the head, a breakwater extends 275m NE; at its outer end is a public wharf extending 122m to the E. The wharf has a least depth of 4.9m alongside.

A lighted bell buoy is moored about 1 mile SW of West Head, at the N side of a rocky patch with a depth of 4.9m.

**1.50 Clarks Harbor** (43°27'N., 65°38'W.), about 1 mile SE of West Head, is obstructed by rocks and shoals, and only recommended to mariners with local knowledge. A buoyed channel leads to a restricted anchorage about 0.5 mile ENE of Fish Island, and another buoyed channel leads to the wharves.

At Swim Point, on the N shore near the inner end of the harbor, there is a public 70m long. There is shelter along the inside face of the outer end, 55m long, with a least depth of 2.4m alongside. A light is shown from a mast on the outer end of the wharf. Close to the E, there are several private wharves and a floating breakwater.

Barrington Passage, entered W of West Head, lies between Cape Sable Island and the mainland. Through navigation is prevented by a causeway, consisting of a rock-filled embankment, connecting the N extremity of Cape Sable Island to the mainland. The passage is partially buoyed. At Newellton, about 1.3 miles NE of West Head, there is a government wharf, with a depth of 2.4m alongside its head, which is 88m long. On the opposite shore of the passage, and close N of Bear Point, there is a government wharf with depths of 1.5 to 2.1m alongside.

The coast of the mainland from Bear Point, on the W side of Barrington Passage to Prospect Point, about 3 miles W, is fronted at a distance of 2.25 miles by an extensive shoal, on which are numerous islets and rocks.

**Stoddart Island** (43°28'N., 65°43'W.) and Inner Island (Prospect Island), close N, lie on the W part of this shoal. A light is shown from a white square tower on the NW point of the island.

Shag Harbor lies N of Stoddart Island, and although open SE, the strength of the sea from that direction is somewhat broken by the ledges SW of Cape Sable.

Outer Island (Bon Portage Island), about 1.3 miles W of Stoddart Island, is the S of a group of islands, with surrounding shoals, extending about 5 miles N to the mainland. Duck Island (Gull Islet), which dries 3m, lies near the outer end of shoals extending about 0.8 mile W of Outer Island. A light is shown from the S extremity of Outer Island, and a lighted bell buoy is moored about 1 mile S of the light.

**Submarine Cable.**—A submarine power cable is laid between the N end of Outer Island and the mainland in a 033°-213° direction. Mariners are warned not to anchor in the vicinity of this cable.

**1.51 The Sound** (Shag Harbor) (43°29'N., 65°44'W.), E of Outer Island, is open S, but the heavy seas from this direction are somewhat broken by the ledges off Cape Sable.

Barrel Rock, with a depth of 3m, and Big Ledge, above-water and marked by a light shown from a white square tower with a white square daymark, lie about 1.8 miles and 2.4 miles N, respectively, of Outer Island, in the S entrance to Cockerwit Passage. The latter passage is shallow, with a least depth of 1.8m, connecting The Sound to Pubnico Harbor. The passage is buoyed and is only recommended to mariners with local knowledge.

**Anchorage.**—Temporary anchorage can be taken in about 14.6m, hard bottom, in The Sound, about 0.5 mile NW of Stoddart Island Light. The best holding ground is reported to be at the S entrance to Cockerwit Passage in about 7.3m, about 0.8 mile S of Big Ledge, and NW of Conquer All, a hill 18.3m high. There is also anchorage for mariners with local knowledge in 9.1m, mud, in Lower Woods Harbor Anchorage, about 0.4 mile SW of Big Ledge.

**Caution.**—In entering The Sound with the flood current, a wide berth should be given to the S point of Outer Island, as the current sets directly for it at a considerable velocity.

## Off-lying Islets and Shoals W of Cape Sable

**1.52 Seal Island** (43°25'N., 66°01'W.), about 17 miles W of Cape Sable, is the largest and S of a group of five islands extending about 7.5 miles N. The middle of the island is low and sandy, while the N and S ends are wooded and about 15.2m high. Seal Island has been reported to be a good radar target at 14 miles, and to be identifiable with the charted feature from the shape and character of the echo at a distance of 7 miles under normal conditions.

Seal Island Light is shown from a white octagonal tower, 21m high, with two red horizontal bands, near the S point of the island. A rectangular building is situated close S of the light.

Blonde Rock, which dries and generally breaks, forms the highest part of a rocky bank, located about 3.5 miles SSE of Seal Island Light. Shoals, with depths of 10m and 8.2m, lie about 0.5 mile and nearly 1 mile W, respectively, of Blonde Rock. These two shoals are marked by very heavy tide rips which show like a breaker. A lighted whistle buoy is moored about 2 miles SSW of Blonde Rock.

**Purdy Rock** (43°23'N., 65°58'W.), with a depth of 4.6m and steep-to, lies about 2 miles ESE of the SE end of Seal Island. The sea breaks on the rock in heavy weather; there is a ripple over the rock in fair weather, during the strength of the tidal current.

Elbow Shoal, with depths of less than 5.5m, lies midway between Blonde Rock and Seal Island. Elbow Rock, with a least depth of 0.9m, lies on this shoal, about 1.3 miles S of Seal Island. Zetland Shoal, with a least depth of 6.1m, lies about 1 mile W of Elbow Rock.

Devils Limb, a rocky islet, 4m high, lies about 1.3 miles WNW of Seal Island Light. Limbs Limb, about 0.5 mile farther N, is a rock which dries 3m. An extensive bank, with depths of less than 5.5m, surrounds the two above-mentioned dangers and connects them to Seal Island.

**Anchorage.**—Temporary anchorage, in good weather or in an emergency, can be taken in depths of about 7.3m, rock and sand, off the E coast of Seal Island, and in Crowell Cove, on the W side of the island.

**Caution.**—There are many isolated shoal patches between Blonde Rock, Seal Island, and the islands N. Mariners should navigate with caution in this area due to the prevalence of fog and the strong tidal currents.

**1.53 Mud Island** (43°29'N., 65°59'W.), 7.6m high, with its S half wooded, lies about 2.8 miles NNE of Seal Island. Noddy Island, 5.5m high, lies about 0.5 mile S of Mud Island; rocks obstruct the channel between the islands. A 4.3m shoal lies about 0.3 mile SW, and a rocky bank, with a least depth of 7.3m and on which there is a tide rip, extends nearly 1.3 miles SSW of Noddy Island.

Black Ledge, which dries about 3m, lies about 1 mile WNW of the S extremity of Mud Island. A group of rocks, one above-water, lies about 0.4 mile N of the ledge, and a 2.1m shoal lies about 275m farther N. Alcor Rock, with a depth of 5.5m, lies about 1 mile W of Black Ledge.

Turbine Shoal (Mud Island Shoal), with a least depth of 4m, lies about 2.3 miles W of the S extremity of Mud Island. This shoal breaks in very heavy weather.

Round Island, 7.6m high, lies about 0.7 mile N of Mud Island. Flat Island, 4m high, lies about 0.5 mile W of Round Island. These islands lie on a bank, with depths of less than 5.5m, extending N and NW of Mud Island. Two islets and a 2.2m shoal lie on this bank, which extends about 0.6 mile N of Flat Island.

Soldiers Ledge, which dries about 2.7m and generally breaks, lies nearly 2.5 miles NW of Flat Island. Two banks, each with a least depth of 2.2m, extend about 1.3 miles S and 0.8 mile ESE from the ledge. A heavy tide rip over several shoal patches extends about 3.5 miles N of the ledge to **Bald Tusket Island** (43°36'N., 66°01'W.). A lighted whistle buoy is moored nearly 2 miles WSW of the ledge.

**Jacquards Ridge** (43°32'N., 66°09'W.), previously named Jacko Ridge, has a least depth of 7.3m near its N end, about 6.5 miles WNW of Flat Island. The ridge extends about 1.5 miles in a N-S direction and has depths of 9.1m near its S end. The ridge shows a long tide rip in good weather and is reported to break in a heavy sea.

**Anchorage.**—Temporary anchorage can be taken in 14.6m, mud, about 0.5 mile SSE of the NE extremity of Mud Island, and also off the E side of Seal Island in about 7m, rock and sand. These anchorages are only recommended in good weather or in an emergency. When approaching from the NW, care is necessary to avoid **Soldiers Ledge** (43°32'N., 66°03'W.), which is connected to Flat Island by a bank with depths of less than 10m.

## Pubnico Harbor

**1.54 Pubnico Harbor** is entered between **St. Ann Point** (Pubnico Point) (43°35'N., 65°48'W.) and the mainland, about 1 mile E. It consists of a narrow inlet 6.5 miles long, the N part of which is encumbered with drying flats. A number of

villages, some of which have berthing facilities, lie on both sides of the inlet and anchorage is available. Boat building, fishing, and fish processing are the principal industries.

The harbor is buoyed and navigable by deep-draft vessels for about 2 miles above its entrance, and small vessels can proceed to within 1.5 miles of its head.

**Johns Island** (43°33'N., 65°48'W.), 29m high and thickly wooded, lies on the E side of the approach to Pubnico Harbor. St. John Ledge, which dries 3.4m and generally breaks, lies about 1.5 miles S of Johns Island. The ledge lies on a shoal bank extending 0.5 mile N and SW from it, and on which the tidal currents set strongly. A rock, awash, lies about 0.4 mile NE of the ledge, and a bank with depths of less than 5.5m, extends ENE to the islands off the mainland.

Pubnico Harbor Light, on **Beach Point** (43°36'N., 65°47'W.), bearing 018° and open W of Johns Island, leads W of Johns Island Ledge. The light is shown from a red and white circular tower.

Shoal patches, with least depths of 8.8m and 6.8m, lie about 3 miles W and 2.8 miles NW, respectively, of Johns Island, on the W side of the approach to Pubnico Harbor.

Only mariners with local knowledge should attempt to enter the harbor, except in an emergency.

**1.55 Pubnico Ledge**, which dries 1.2m, extends about 0.4 mile offshore from the W side of the harbor, about 1 mile NE of St. Ann Point.

A shoal, with a depth of 4m, lies on the E side of the channel, about 0.8 mile N of Beach Point.

At Denis Point, on the W side of the harbor, about 1.8 miles NNE of St. Ann Point, there is an enclosed boat harbor, with depths of 1.8 to 3.4m, in the outer half of the basin. A shoal, with a depth of 0.6m, lies about 0.1 mile E of the boat harbor.

Most of the N part of Pubnico Harbor is encumbered by drying flats.

**Depths—Limitations.**—At Lower East Pubnico, about 0.7 mile NNE of Beach Point, there is a wharf, 186m long and 13m wide, with a depth of 4.3m across the outer end.

At Middle East Pubnico, about 3 miles N of Beach Point, there is an L-shaped wharf which extends 46m W, with a least depth of 7.9m alongside the outer face, and is 30.5m wide. There are conspicuous buildings and tanks close E of the wharf.

At the West Side of the Harbor, there are three L-shaped piers which extend about 183m S of Denis Point and form two enclosed boat basins with depths of 1.8 to 3.4m in the outer parts. A light stands on the head of the S pier. Attention is called to a 0.6m shoal close off the entrance of the N basin.

**Caution.**—A submarine cable is laid across the harbor, 1.5 miles N of Beach Point.

**Anchorage.**—There is anchorage in about 17m, mud, about 1 mile N of Beach Point.

## Pubnico Harbor to Frenchman Point

**1.56** The coast between St. Ann Point and **Frenchman Point** (43°38'N., 66°01'W.), the S end of Tusket Island, about 9.5 miles WNW, recedes to form **Lobster Bay** (43°37'N.,



65°55'W.), an extensive bay encumbered by islands and shoals, among which small vessels can find good shelter; however, local knowledge is necessary. No detailed description will be given, and only the more frequented harbors and anchorages and the principal dangers in their vicinity will be mentioned.

**The Peak** (43°36'N., 65°51'W.), with a least depth of 4m, lies about 2 miles NW of St. Ann Point. Nearly abreast of this shoal, a rocky spit, with a least depth of 1.8m, extends about 0.4 mile W from the mainland. There are tide rips over these dangers and the passage between them is about 0.5 mile wide, with depths of 9.1 to 20.1m. The Brothers are two similar islands, 3m high, lying close to the mainland about 2 miles NNW of St. Ann Point.

**Abbot Harbor Light** (43°40'N., 65°49'W.), bearing 008° and open W of the S island of The Brothers, leads between the spit and The Peak.

Abbot Harbor, between Abbot Island and the mainland, provides good shelter to small craft.

**Whitehead Island** (43°40'N., 65°52'W.), 22m high, with conspicuous reddish earth cliffs on its S side, lies about 1.8 miles W of Abbot Island. Whitehead Ledge, which dries 0.3m, lies about midway between Whitehead Island and Abbot Island. The ledge is marked by a buoy.

**Caution.**—A submarine power cable is laid from Whitehead Island to the mainland N of Abbot Harbor. Mariners are cautioned not to anchor in the vicinity of this cable.

Pumpkin Island, 13.1m high, lies about 0.5 mile N of Whitehead Island. Pumpkin Ledge, which dries 0.3m, lies nearly 0.5 mile E of the island.

Jones Island lies about 1.5 miles NNW of Whitehead Island. Jones Ledge, about 0.4 mile S of Jones Island, dries 0.6m at its N end. Jones Anchorage, about 0.4 mile N of Jones Island, is available to mariners with local knowledge in depths of 11m. Restricted anchorage can also be found in Hog Island Channel.

## Tusket River

**1.57** Tusket River is entered between **Western Bar Island** (43°41'N., 65°59'W.) and Wilson Point, about 2.5 miles NE. The river provides good shelter, and the two entrance channels, narrow and obstructed by dangers, are available to vessels of not more than 4.6m draft, and should not be attempted without local knowledge.

Gull Island, about 2 miles W of Whitehead Island, lies in the approach to Tusket River. A stony spit, named Gull Island Bar (Gull Bar), extends about 0.5 mile N. Gull Ledge, with a depth of 4m, lies about 2 miles S of Gull Island; a buoy is moored S of the ledge. A submerged wreck lies E of the ledge. Dollard Rock (Dolland Rock), with a least depth of 3.7m, lies about 1 mile NW of the ledge; it is marked close S by a buoy. Angus Shoal (SW Shoal), with a depth of 4.6m, lies about 1 mile SW of Gull Island.

Eastern Bar Island (Gooseberry Island), located about 0.5 mile SW of Wilson Point, lies near the S extremity of an extensive bank, with depths of 0.9 to 5.2m, which separates the two entrance channels. Fish Ledge, which dries 2.7m, about 0.5 mile farther W, lies on the SW part of the bank.

Tusket River Light (white square, tower, 11m high) is shown from Big Fish Island, on the W side of the above-mentioned

bank, and about 1 mile NW of Eastern Bar Island. Big Fish Rock, which dries, lies on the E side of the W channel, about 0.3 mile WNW of the same Big Fish Island.

On the E side of Tusket Wedge, about 1.3 miles ENE of Wedge Point, there is an enclosed harbor for small fishing craft. Tusket Wedge Light is shown from a mast, situated at the above mentioned harbor for small fishing craft.

**Tides—Currents.**—The tidal current has a velocity of about 2 knots, about 1.5 miles N of Tucker Island. The tidal current, about 5 miles above the island, has a velocity of 5 knots.

**Anchorage.**—There is anchorage in about 11m, mud, about 0.4 mile N of Tucker Island. There is also anchorage in the same depth, about 1.5 miles farther up the river.

**Caution.**—A submerged power cable is laid between Big Fish Island and Tusket Wedge, close S of the harbor.

Tucker Island lies near the N end of the bank, and about 0.5 mile N of Big Fish Island. Tucker Island Ledge, with a depth of 1.5m, about 0.3 mile W of the island, lies on the W side of the W channel.

## Tusket Islands

**1.58** The Tusket Islands is a group of islands lying close S of the mainland on the W side of the entrance to the Tusket River. **Big Tusket Island** (43°39'N., 66°01'W.), the highest island, has an elevation of 30.5m. Schooner Passage and Ellenwoods Passage lead through the group in a general NW-SE direction, but should only be used by small vessels with masters having local knowledge. Only a general description of the islands and dangers will be given.

**Tides—Currents.**—Among the Tusket Islands, the general direction of the flood current is NW, and the ebb current SE, but the direction is influenced by the land. Heavy tide rips and eddies are numerous. The average velocity of the tidal currents is from 2 to 4 knots, and probably more in the vicinity of some of the points. In Schooner Passage, the current velocity is 3 knots, and off the NE point of Ellenwood Island it runs at a velocity of 4 knots.

**Caution.**—Many submarine cables are laid between many of the Tusket Islands and to the mainland. Mariners are cautioned not to anchor in the vicinity of the cables.

**1.59 Frenchman Point** (43°38'N., 66°01'W.) is the S extremity of Big Tusket Island. A light is shown from a red skeleton tower on a rock about 0.5 mile SW of the point. Peases Island Ledge, about 0.3 mile farther SW, dries 0.9m and lies near the SW extremity of a bank extending SW from the point. A lighted bell buoy marks the extremity of shoals extending SE of the point.

Old Woman, a rock which dries 3.4m, lies about 1.3 miles E of Frenchman Point. The rock and surrounding shoal is marked S by a buoy. A rock, with a depth of less than 1.8m, lies 0.5 mile NNE of Old Woman.

Old Man, a rock which dries 1.5m, lies about 1.8 miles S of Frenchman Point and is marked E by a buoy. Little Bald Tusket Shoal, with a depth of 2.7m, lies about 0.7 mile NW of Old Man.

Peases Island, about 1 mile SW of Frenchman Point, is marked by a light on its SE extremity.

**Outer Bald Tusket Island** (43°36'N., 66°02'W.), 16m high and bare, about 1.8 miles S of Peases Island, is the S island of the group. With a steep cliff and a single dwelling at its S end, the island, which is radar conspicuous, is easily recognized from the other islands in the group. The bottom everywhere is uneven and irregular with numerous dangers.

Cleopatra Shoal, with a least depth of 3m, lies nearly 1.8 miles SSE of Outer Bald Tusket Island.

A 3.2m rocky patch lies about 2 miles SSW of Outer Bald Tusket Island. There is also a heavy tide rip between the shoals S of the latter island and Soldiers Ledge, which was previously described in paragraph 1.53.

**Spectacle Islands** (43°38'N., 66°04'W.) are the W islands of the group. Spectacle Ledge, with a least depth of 3m, lies about 0.8 mile S of the islands. A lighted bell buoy lies about 0.8 mile farther S.

Candlebox Island, marked by a light, lies about 2 miles NW of Frenchman Point, near the N entrance to Schooner Passage, on the E side of the fairway.

Murder Island, with its SE extremity about 0.5 mile farther NW, is the N island of the group. Murder Island Shoal, with a least depth of 3m, lies about 0.7 mile SW of the island. Holmes Spit, with a least depth of 1.8m, lies about 0.8 mile farther S.

Ellenwoods Passage branches from Schooner Passage, N of Peases Island, passing W of Allen Island and Owls Head.

### Off-lying Dangers W of Tusket Islands

**1.60 Gannet South Shoal** (43°34'N., 66°07'W.), about 5.5 miles SW of Peases Island, with a depth of 4.6m, sometimes breaks in a very heavy sea and shows a small ripple in good weather. Gannet Southwest Shoal, about 2 miles NW of Gannet South Shoal, with a least depth of 3.6m, shows a small ripple in good weather, and breaks in a heavy sea.

**Gannet Rock** (43°38'N., 66°09'W.), about 3.5 miles W of the Spectacle Islands, has a sugar loaf peak, 15m high, near its S end, and a hillock, nearly the same height, near its N end. Two rocks, the higher of which dries 4m, lie close together, about 275m S of the peak. North Rock, which dries 1.8m, and Peter Stewarts Rock (South Rock), which dries about 1.8m, lie about 0.2 mile N and 0.7 mile S, respectively, of Gannet Rock. The sea generally breaks over both these rocks.

Gannet Dry Ledge, marked close E by a buoy, about 1.8 miles SW of Gannet Rock, dries 3m and generally breaks. A lighted bell buoy is moored nearly 1.8 miles W of the ledge. Southeast Breaker (Southeast Rock), about 1.8 miles E of the ledge, has a least depth of 1m and breaks in a heavy sea.

Green Island, 15.2m high and marked by a light, lies 3 miles N of Gannet Rock. An above-water ledge extends nearly 0.3 mile from the S end of the island, and a bank, with depths of 1.8 to 5.8m, extends about 0.5 mile farther S. A submarine cable is laid from Green Island NE to the mainland.

### Tusket Islands to Yarmouth Harbor

**1.61 Pinkney Point** (43°42'N., 66°04'W.), the S extremity of Pinkney Island, lies about 1.5 miles N of Murder Island. A lighted bell buoy is moored about 0.3 mile SSE of Pinkney Point, on the edge of the shore bank with a depth of 3.7m.

Shoals, with least depths of 3.7m, lie about 1.3 miles WSW and 0.8 mile WNW of the same point.

Pinkney Point Light is shown from the rubble extension at the end of a 235m long breakwater on the SE side of Pinkney Island. Ram Island light is shown about 1 mile farther E. On the E side of Pinkney Point, a rock breakwater protects two L-shaped wharves with depths of 0.9 to 1.5m along their outer faces.

The village of Little River Harbor lies about 1.5 miles ENE of Pinkney Point, and about 0.3 mile E of the SE extremity of Big Cook Island. Little River Harbor Light is shown from a small island close W of the village. A government wharf at the village is 79m long with a depth of 1.8m at the outer end; the wharf is protected by a breakwater about 57m long.

**Chebogue Harbor** (43°44'N., 66°06'W.), which provides shelter for small vessels, is entered between Reef Island, 16m high and located about 0.8 miles W of the N extremity of Pinkney Island, and Chebogue Point, flat, treeless, and on which there is a conspicuous silo, nearly 1.5 miles further WNW. A depth of not more than 3.4m can be carried over the bar W of Garden Head, which lies nearly 1 mile E of Chebogue Point. At Central Chebogue, about 3.8 miles NNE of Chebogue Point, there is an L-shaped government wharf, 53m long, with a least depth of 3.4m along its outer face and 1.8m along its inner face. The channel through Chebogue Harbor is buoyed from Chebogue Point to the N end of Clemment Island; however, only mariners with local knowledge should attempt this passage.

Chebogue Ledge, drying 0.7m and marked by a buoy, lies about 1 mile SW of Chebogue Point. There is a tide rip over this ledge, and it generally breaks at LW. Chebogue Point Shoal, with a least depth of 3.7m, lies about 0.8 mile S of the same point.

Foul Ground, with a least depth of 1.9m and over which there is a tide rip, lies about 1.3 miles NW of Chebogue Point. A 7.7m patch lies nearly 0.8 mile SSW of Foul Ground. Roaring Bull, a rock which dries 0.9m and is marked on its W side by a buoy, lies about 0.7 mile NW of Foul Ground, to which it is almost joined by a bank.

**Sunday Point** (43°47'N., 66°08'W.), the E entrance point of Yarmouth Harbor, lies about 3 miles NNW of Chebogue Point. Foul ground, with an islet 12m high on it, extends about 0.3 mile SSW of the point. Two shoals, with depths of 8.6m and 8.7m, lie about 0.5 mile SW and 1 mile SSW, respectively, of Sunday Point.

**Vessel Traffic Management.**—The S limit of the Bay of Fundy vessel traffic management system extends in a 270° direction from Chebogue Point. All vessels of 20m or more in length are required to report when crossing the S limit in any direction.

**1.62 Yarmouth Harbor** (43°50'N., 66°07'W.) (World Port Index No. 6460) is open throughout the year, and is available to vessels of moderate draft. It is an important transfer point for goods and passengers between Nova Scotia and the United States, via Bar Harbor and Portland, Maine. Lumber, fish, and pulpwood are exported. There is a large fishing industry in the town as well as a cotton mill.

**Tides—Currents.**—The tidal rise at Yarmouth is 4.4m at MHWS, and 3.8m at MHWN.

The tidal current changes its direction shortly after HW and LW by the shore. Between Tusket Islands and Yarmouth, the inshore flood currents run NW at a maximum velocity of 3 knots. About 4 miles W of the entrance to Yarmouth Harbor, the flood currents run N with a velocity of up to 2 knots, and ebb currents run S with velocities of up to 1.65 knots.

**Depths—Limitations.**—The berths in the inner harbor are approached by a dredged channel with a limiting depth in 1994 of 6.5m; there is a limiting depth of 6.3m in the turning basin off the berths. Mariners are advised to obtain the latest information from the Harbor Authority.

The Ferry Terminal Wharf is 122m long, with a stern loading pontoon at its S end, and a least reported depth of 4.9m. This ro-ro berth provides services to Bar Harbor and Portland, Maine.

A T-shaped government wharf is situated close S of the ferry terminal. It is 152m long and had a least reported depth of 6m.

A government wharf, 122m long, and N of the ferry terminal, had depths of 5.6m alongside its outer face and 2.1m alongside its inner face.

Sweeney's Wharf, formerly Evangeline Wharf, is 183m long, with a least depth alongside of 3m.

There is a turning basin off Sweeney's Wharf, 304m long and 243m wide.

**Aspect.**—Yarmouth Harbor is entered between Sunday Point and Cape Fourchu, the S extremity of a group of islands connected by drying flats, about 0.8 mile WNW of Sunday Point.

Cape Fourchu, high, rocky, treed, and almost an island to itself, has a decidedly different appearance from the

surrounding coast. It derives its name from having two narrow, rocky forks that extend to the S. East Cape, the E fork, is joined to West Fork, about 0.5 mile NW, by a low, narrow beach. A light is shown from a 23m high red and white vertically striped hexagonal tower about 0.3 mile N of the S extremity of East Cape. A lighted bell buoy is moored about 0.5 mile S of East Cape. The channel to the wharves is buoyed.

Hen and Chickens, a group of rocks, one of which dries 3m, lies close to the E side of the entrance, about 0.5 mile N of Sunday Point. A lighted bell buoy is moored close W of the rocks.

Ships Stern, a conspicuous headland, 15.2m high, marked N by a light, lies about 1 mile N of Cape Fourchu Light.

Little Bunker Island, 6.1m high, lies about 0.3 mile NE of Ships Stern, and is connected NW to Bunker Island, 22.6m high, by a drying reef. Bunker Island Light is shown near the outer end of a drying reef extending about 110m SW of Little Bunker Island. There are a number of white oil tanks near the center of Bunker Island.

Sollows Rock, which dries 0.6m, lies on the W side of the channel, about 275m WNW of Little Bunker Island. A monument, 4.6m high, stands on Johnson Point (Fish Point), located about 0.3 mile NNE of Sollows Rock.

The harbor N of Bunker Island is almost entirely occupied by drying flats of mud and sand, through which a channel leads to the inner harbor and wharves at the town of Yarmouth. Doctor Island, 4.6m high and wooded, lies on the drying flat abreast the town.

A tower, painted in red and white bands, marked by red aircraft obstruction lights, and with an elevation of 78m, is conspicuous about 5.5 miles NE of Cape Fourchu.



Cape Fourchu Light

**Anchorage.**—There is no safe anchorage in Yarmouth Harbor. The channel is narrow and affords no swinging room.

In good weather, anchorage is available outside the harbor in varying depths in an established anchorage area W of Cape Fourchu, reported good holding ground.

At Yarmouth Sound, there is an outer anchorage in 12.8 to 18.2m of water at LW; and an inner anchorage lies W of Bunker's Island in 12.8m, mud.

**Caution.**—Yarmouth Harbor is subject to constant silting due to strong tidal currents, and all depths are uncertain and should be checked with local authorities.

A submerged pipeline extends in a NW direction about 0.8 mile NE of Johnson point. A headwall is visible at the outer end of the pipeline at LW.

## Yarmouth Harbor to St. Marys Bay

**1.63 Lurcher Shoal** (43°51'N., 66°29'W.), an off-lying danger, consisting of two separate shoal heads, lies about 14 miles WNW of Cape Fourchu. Southwest Shoal, the larger of the two shoal heads, has a least depth of 2.1m. A bank, with uneven depths of 12.8 to 18.3m, extends 1.75 miles NNE and N, and 0.75 mile SW, from the shoal. There is a heavy tide rip over the N part of the bank.

Northeast Shoal, about 2.5 miles NNE of Southwest Shoal, has a least depth of 8.5m and is marked by heavy tide rips. Uneven ground, with depths of 11.3 to 18.3m, in places, and over which there are heavy tide rips, extends 1 mile NNW, 0.5 mile NE, and about 0.3 mile S of the shoal.

A lighted whistle buoy is moored about 0.7 mile WSW of the shallowest part of Southwest Shoal.

A lighted whistle buoy is moored about 1.3 miles NE of Northeast Shoal. A lighted whistle buoy, marked "M" and "Fundy Entrance South", is moored at the seaward end of the traffic separation scheme, about 28 miles NW of Lurcher Shoal. The buoy is equipped with a racon.

Little Lurcher Shoal, with a depth of 21.9m, is located about 3.8 miles SE of Southwest Shoal.

## Yarmouth Harbor to St. Marys Bay

**1.64 Chegoggin Point** (43°51'N., 66°10'W.), about 3.5 miles N of Cape Fourchu (West Cape), is 13.1m high and lies at the N end of an open bight. Three radio towers, marked by red lights, are situated about 1 mile SE of Chegoggin Point. A lighted bell buoy is moored about 0.8 mile SW of the point.

**Caution.**—It has been reported that Chegoggin Point and the West Cape, Cape Fourchu appear almost identical on a radar display at short range. Caution should be exercised when navigating this part of the coast.

Between Chegoggin Point and Cranberry Point, about 2.5 miles N, rocks and shoals, with depths of 1.8 to 9.1m, extend about 0.6 mile off the low and partially wooded coast.

The coast between Cranberry Point and the village of Standford (Sanford), about 1.5 miles NNE, rises to hills with an elevation of 33.5m a short distance inland. A sector light is shown from a tower. The white sector indicates the preferred channel to the breakwater-wharf at Standford. A lighted bell buoy is moored about 1.3 miles NW of the breakwater-wharf.

Red Head, 21.3m high, lies about 2.5 miles N of Standford. Burns Point lies about 0.8 mile farther N.

Black Point, 6.1m high, lies about 3.5 miles N of Burns Point. Between the points is an open bight from which a bank, with depths of less than 9.1m, extends about 0.7 mile seaward. A 7.1m patch lies about 1.3 miles SSW of Black Point.

**Port Maitland** (43°59'N., 66°09'W.) is a small drying harbor, formed by three breakwaters, near the S end of the above-mentioned bight. A light is shown from a mast at the outer end of the N breakwater. A lighted bell buoy is moored nearly 1 mile NW of the light.

**Off-lying Dangers.**—**Trinity Ledge** (44°00'N., 66°18'W.), about 6.5 miles W of Port Maitland, consists of three rocks, the highest drying 0.9m. The ledge breaks in a heavy sea. There is a heavy tide rip over the ledge and also for a distance 1.5 miles NE of it. A 9.9m patch lies about 1.8 miles ENE of the ledge.

A lighted whistle buoy is moored nearly 1 mile S of Trinity Ledge.

Trinity Ledge lies near the outer edge an extensive bank extending E and NE to the mainland, with depths of less than 18.3m, on which there are numerous shoal heads from 4.6 to 11m. Mavillette Shoal, with a depth of 6.7m, lies on this bank, about 1.5 miles S of Cape St. Mary.

**Tides—Currents.**—Near Trinity Ledge, the flood current sets N and the ebb current S, with a velocity of 2.5 knots.

## St. Marys Bay

**1.65 St. Marys Bay** (46°14'N., 62°30'W.), entered between Cape St. Mary and Brier Island, about 11 miles NW, is sheltered W by Brier Island, Long Island, and Digby Neck, which are separated from each other by Grand Passage and Petit Passage, respectively. The bay extends about 32 miles NE from its entrance, and is encumbered with shoals for a distance of 12 miles from its head, but the remainder is deep and clear of dangers, except within 1 to 2 miles of the SE shore. The NW shore is steep-to.

The level of the water in St. Marys Bay is raised by SW winds and lowered by NE winds.

**Cape St. Mary** (44°05'N., 66°13'W.), the SE entrance point of St. Marys Bay, is marked by a light, shown from a white tower on the NW corner of a white building. On the E side of Cape St. Mary there is a T-shaped public wharf, 70m long and 10m across the outer face, having a depth of 0.9m at the outer end. Close S a mole extends 130m NE from the shore, with a berthing length on the NW side of about 70m. Depth alongside the head of the mole is 0.9m and about 0.3m along the outer part of the NW face. Close S of the mole a rubble breakwater, which exhibits a light and radar reflector from a mast at its head, extends E from the cape and provides protection to the pier and the mole. A buoy lies about 183m E of the mole. A lighted buoy (safe water; bell) is moored 0.8 mile S of the cape.

A drying rocky ledge extends about 0.3 mile S of the cape, and a shoal spit, over which there is a heavy tide rip, extends 0.75 mile SSW of the cape.

**Whipple Point** (44°14'N., 66°24'W.), lying about 12 miles NW of Cape St. Mary, is the SW extremity of Brier Island. Brier Island Light is shown from a white tower, with three red horizontal bands, about 0.8 mile N of Whipple Point. From the SE point of Brier Island, rocky ledges, some of which dry,



**Brier Island Light**

extend to Gull Rock, 1.8m high, about 1.5 miles SSW. A detached 5.5m patch lies about 0.2 mile SSW of Gull Rock. A lighted bell buoy is moored nearly 0.5 mile S of Gull Rock.

Brier Island Southwest Ledge, with a least depth of 4.1m, lies about 2 miles SW of Gull Rock. The ledge is surrounded by a bank with depths of less than 18.3m extending nearly 0.8 mile S and 0.8 mile NE from it. A heavy tide rip extends about 1.5 miles SSW from the ledge and NE to Gull Rock. A lighted whistle buoy is moored about 1.8 miles SW of the ledge.

**McDormand Patch** (44°05'N., 66°29'W.), a rock with a depth of 24m, lies 9.5 miles SSW of Whipple Point.

**Anchorage.**—Suitable anchorage can be found in almost any part of St. Marys Bay, except with SW winds, when it is necessary to proceed to the head of the bay to obtain good shelter.

Large vessels can anchor in the upper part of the bay and ride out a SW gale in depths of 18.3 to 21.9m, between **East Sandy Cove** (44°29'N., 66°05'W.) and the mouth of the Sissiboo River.

Vessels of moderate draft can anchor in 10.1m, about 0.7 mile NNW of the entrance to Sissiboo River, or in 7.3m, about 0.7 mile N of **Gilbert Point** (44°30'N., 65°57'W.).

### **East Side of St. Marys Bay**

**1.66** The E side of the bay, from Cape St. Mary to close S of the village of **Meteghan** (44°12'N., 66°10'W.), about 7 miles NE, is from 21.3 to 30.5m high and free from off-lying dangers. At Meteghan, there is an L-shaped breakwater, 293m long, constructed of large boulders and marked with a light. East of the breakwater, there is an L-shaped Public wharf used primarily by fishing vessels. The wharf is about 213m long

with a 152m long outer end that has depths of 2.1 to 4.2m alongside. A lighted bell buoy is moored nearly 1.5 miles WNW of the government wharf.

A patent slip and marine railway, with a lifting capacity of 600 tons and a machine shop for minor repairs, is situated close E of the public pier. The slip can accommodate vessels with maximum dimensions of 53m in length, 12m width, and 5.2m draft. It is generally used by vessels of about 40m in length.

About 2 miles farther NNE, a small harbor formed by two breakwaters lies at the mouth of the Meteghan River. In the sheltered area, there is a government wharf with a depth of 6.1m at the outer end at HW.

From Meteghan to Church Point, about 8.5 miles N, houses and villages are scattered along this section of coast. Rocky shoals, with depths of 2.7 to 9.1m, extend in places from 0.25 mile to about 1.8 miles W from the coast. A lighted bell buoy is moored about 1 mile WNW of the breakwater at Saulnierville, which is situated about 2.5 miles N of Meteghan River.

**1.67** At **Saulnierville** (44°16'N., 66°08'W.), a public mole extends into a depth of 0.9m. A light (framework tower, 5m high) is exhibited at its head. A lighted buoy is moored 0.8 mile WNW of the mole.

At **Church Point** (44°20'N., 66°08'W.), a conspicuous steeple rises from a large Roman Catholic church near the point.

Shoals and mud flats, which dry in places, extend up to 0.75 mile offshore between Church Point and Cape Firmain, about 6 miles NE. A rock, with a depth of 14.1m, lies about 1.8 miles W of Church Point. A privately maintained light is exhibited about 1.5 miles SW of Cape Firmain at Belliveau Cove.



**Sissiboo River** (44°27'N., 66°01'W.), a very shoal estuary, can only be entered by mariners with local knowledge a short time before HW. Sissiboo Light is shown from the S side of the entrance to the river. A dredged and buoyed channel, with a least depth of 1.1m in mid-channel in 1992, leads to the wharf at the village of Weymouth North, about 0.8 mile above the bar. The L-shaped wharf here has an outer face 85m long with a least depth of 2.9m alongside. Pilotage is not compulsory; however, a local pilot is available. A lighted bell buoy is moored about 1.5 miles NW of Sissiboo Light.

The coast between Sissiboo River and Gilbert Point, about 4 miles NE, is fronted by a shore bank, with depths of less than 5.5m, extending about 0.5 mile offshore.

St. Mary Shoal, an extensive bank with depths of less than 5.5m and a least depth of 2.9m, lies on the NW side of the bank opposite Gilbert Point.

## West Side of St. Marys Bay

**1.68** The SE coast of Brier Island is steep-to from its SE extremity to **South Point** (44°15'N., 66°21'W.), about 2 miles N. A lighted bell buoy is moored nearly 1 mile S of South Point, and marks the fairway of the S approach to Grand Passage.

## Grand Passage

**1.69** This passage, between Brier Island and Long Island, has a depth of 11m in the fairway. The tidal currents, both ebb and flood, attain a rate of 5 or 6 knots and constitute the principal difficulty in the navigation of the passage. Slack water occurs 57 minutes and 1 hour 18 minutes, respectively, before the times of HW and LW at Saint John, New Brunswick.

Peter Island lies on the W side of the S entrance. The channel between the island and the W shore has a depth of 4.9m. A light is shown from a white 8-sided tower, 12m high, on the island. A drying reef extends about 0.1 mile N of the island.

The village of Freeport lies at the head of a bay, dry at LW, on the E side of the passage. A breakwater on the S side of the bay protects a government wharf, with a depth of 6.7m at the outer end at HW. A government pier extends from the N entrance point of the bay to a depth of 5.2m at HW.

The village of Westport lies on the SW side of Grand Passage. An L-shaped government wharf at Westport has a depth of 4.6m at the outer end. Westport Harbor is open through the year and provides anchorage for small vessels, ESE of the pierhead, in 9.1 to 12.8m, sand, about 0.4 mile ENE of the Baptist Church in the village. Vessels using the anchorage are recommended to moor with a swivel to avoid fouling their cables due to the eddies.

Grand Passage Light is shown from a white tower on **North Point** (44°17'N., 66°21'W.), the N extremity of Brier Island, and the W entrance point for the N entrance to the passage.

Passage Shoal, marked N by a buoy and with a depth of 2.6m, lies in the middle of the passage, about 0.4 mile N of Peter Island. There is a channel on either side of this shoal.

Cow Ledge, which dries, and Bald Rock lie near the shore of Long Island, on the E side of the N entrance to the passage.

Shoals extend N of Cow Ledge, and terminate in Cow Ledge Shoal, with a depth of 5m, about 0.3 mile SE of North Point. The latter shoal is marked NW by a lighted bell buoy.

**Directions.**—Vessels approaching Grand Passage from S should steer to pass E of Peter Island and Passage Shoal. After clearing Passage Shoal, steer in mid-channel until W of Bald Rock, where Peter Island Light, bearing 180° and open the breadth of Peter Island W of Sand Point, leads in mid-channel W of Cow Ledge and Cow Ledge Shoal and E of the bank extending about 275m NNE of North Point.

Vessels approaching the passage from the N should reverse the above directions.

**Caution.**—Mariners without local knowledge should exercise caution in navigating Grand Passage due to the strong tidal currents and eddies.

A submarine cable is laid between Sand Point and Brier Island to W. Another cable extends from Sand Point to Peter Island, then to South Point.

The E coast of Long Island is steep-to from **Dartmouth Point** (44°15'N., 66°20'W.), the S extremity of Long Island, to Petit Passage. The bold SE shore of Digby Neck, from Petit Passage to abreast St. Mary Shoal, is steep-to and indented by three coves. At Little River Cove, a wharf extends 46m to a depth of 3m and is sheltered by a breakwater. At Mink Cove, about 1.5 miles NE of Little River Cove, a fish meal plant is visible from seaward. In East Sandy Cove, the channel to the wharf is buoyed and dredged and had a least depth of 4m. The channel leads to a T-shaped concrete wharf with an outer face 110m long and a depth of 4.3m alongside most of its length. A depth of 2.8m is located close off the S corner. The inside face is 76m long with a least depth of 3m alongside. The dredged area extends 55m off the outer face of the pier. A wooden wharf, from which a light is exhibited on its outer end, lies SE of the concrete wharf.

## Petit Passage

**1.70** This passage, between Long Island and Digby Neck, is almost straight, with a least width of about 410m, and is the shortest route from Cape Fourchu to Saint John. The land on either side of the passage is high, rising to an elevation of 73m on the E side. The passage has a least charted depth of 11m. The navigable channel narrows to a little more than 0.1 mile between **Eddy Point** (44°24'N., 66°13'W.), on the W side, at the middle of the passage, and the drying bank extending about 0.1 mile from the opposite shore.

**Tides—Currents.**—The direction of the tidal currents in the passage is N with a rising tide, and S with a falling tide. The maximum flood current is 8 knots, while the maximum ebb current is 7 knots. Slack water occurs 1 hour and 1 hour 03 minutes, respectively, before the time of HW and LW at Saint John.

A ledge, which dries 3m, extends about 0.1 mile S of the E point of the S entrance of the passage. A lighted bell buoy is moored about 0.2 mile S of the same point.

The village of Tiverton, close W of Eddy Point, has a government wharf, 152m long and 12m wide at the outer face, with a depth of 5.5m alongside. Tiverton Light is shown from a skeleton tower, 3m high, near the outer end of the wharf.



Grand Passage Light

At East Ferry, on the opposite side of the passage from Tiverton, there is a wharf, 73m long, and 11m wide at the outer face, with a depth of about 4.9m alongside the outer face. There is a breakwater N of the wharf; a submerged rock lies about 0.1 mile SW of the breakwater.

Overhead power cables, with a clearance 43m, cross Petit Passage from Tiverton to East Ferry, where the channel is at its narrowest.

**Prohibited Anchorage.**—Due to submarine cables, anchorage is prohibited in Petit Passage.

**Boars Head** (44°24'N., 66°13'W.), from which a light is shown, forms the W side of the N entrance to the passage. A 2.1m shoal, marked by a ripple during the strength of the tide, lies about 0.3 mile N of the head.

A radar tower, with an elevation of 75m, is situated about 1 mile SSW of Boars Head Light. A microwave tower is situated close NW of the radar tower.

## Brier Island to Annapolis Basin

**1.71 Lighthouse Cove** (44°15'N., 66°24'W.), on the W side of Brier Island, lies about 0.8 mile N of Whipple Point, the SW extremity of the island. Brier Island Light, previously described in paragraph 1.65, is shown from the S entrance point of the cove. A rock, which dries 1.2m, lies about 0.3 mile offshore and 0.4 mile N of the light.

The NW coast of Brier Island, from Lighthouse Cove to North Point, the N extremity of the island, is fringed with rocks and the 9.1m curve extends 0.25 mile from the shore in places.

**Off-lying Dangers.**—Northwest Ledge, an extensive shoal bank, lies 3 miles NW of Brier Island. Northwest Rock, its shallowest spot, with a depth of 2.6m near the N end, lies about 3.3 miles NW of North Point. A buoy is moored about 0.3 mile N of this rock. Beatson Rocks, each with a depth of 4.7m, are located in the SW part of Northwest Ledge, about 1 mile SW of Northwest Rock. Frenchmans Elbow, with a least depth of 9.6m, lies about 1 mile SE of Northwest Rock. There are heavy tide rips over the above dangers and also over the uneven ground between them.

A lighted whistle buoy is moored nearly 0.5 mile SW of Beatson Rocks.

North Point, in line bearing 134° with Mourilyans Mark, a large granite boulder on Long Island, leads NE of Northwest Ledge.

Moore Ledge (Moores Ledge), with a depth of 20.1m, over which there is a heavy tide rip, lies about 3.3 miles N of North Point.

Tidal currents set over Northwest Ledge with a maximum velocity of about 4 knots, setting N when the tide is rising in Grand Passage, and S when the tide is falling.

**Traffic Separation Scheme.**—For vessels entering or departing from the Bay of Fundy, there is a compulsory separation scheme about 11 miles NNW of Brier Island.

**1.72** The NW coasts of Long Island and Digby Neck, from Grand Passage to **Gullivers Head** (Gulliver Point) (44°37'N., 65°56'W.), about 27 miles NE, is bold, wooded, and free of off-lying dangers. The coastal hills increase in elevation from about 46m near the S end of Long Island to over 122m near Gullivers Head.

Sandy Cove, about 7 miles NE of Petit Passage, affords good shelter for small craft from S winds. A rock, with a depth of 1.8m, lies about 0.3 mile NNE of the W entrance point of the cove. On the E side of the cove there is a mole, 88m long with a depth at the outer end of 5.5m at HW. A gridiron is situated alongside the mole.

Trout Cove, about 4.5 miles NE of Sandy Cove, has a small drying basin formed by breakwaters at its head. Centreville Light is shown from the W entrance to Trout Cove. A lighted bell buoy is moored nearly 0.5 mile NW of the W entrance.

Gullivers Cove (Gulliver Cove), close E of Gullivers Head, affords good shelter from S winds in depths of 12 to 14.6m.

From Gullivers Head to Prim Point, about 7.5 miles NE, the coast is bold with the coastal hills rising to elevations over 122m.

**Tides—Currents.**—Between Grand Passage and Prim Point the tidal currents set parallel to the coast. The tidal currents have a velocity of 2 to 2.5 knots S of Gullivers Head, and a velocity from 1.5 to 2 knots between Gullivers Head and Prim Point.

## Annapolis Basin

**1.73** Annapolis Basin, the SW portion of the estuary of the Annapolis River, is protected and open throughout the year; however, gales from the N and NW raise a heavy sea, which when drift ice is present, may damage a vessel. The basin affords good anchorage to deep-draft vessels. The harbor of Digby is located in the SW part of the basin.

**Digby Gut** (44°41'N., 65°46'W.), a deep passage about 0.4 mile wide between high, steep shores, leads to Annapolis Basin. **Prim Point** (44°42'N., 65°47'W.), the W entrance point of Digby Gut, is marked by a light shown from a white tower, with red vertical stripes, on the corner of a square building. Digby Gut Light is shown from a skeleton tower on the E side of the entrance. A lighted whistle buoy is moored about 1.3 miles NNE of Prim Point.

Man of War Rock, with a depth of 6.7m, lies about 0.1 mile from the W side of the passage, about 1 mile SE of Prim Point. Close S of Man of War Rock, banks extending about 0.1 mile from either shore reduce the width of the passage.

At Victoria Beach, a light is shown near a drying basin formed by two breakwaters, each about 100m long. A large fish processing plant stands near the N breakwater. There is a groin, 61m long, close N of the N breakwater.

At Rattling Beach, about 1 mile farther S and on the W side of the passage, there is the Marine Atlantic ferry terminal and from it is operated a regular ferry service to Saint John. The berth is 140m long with a least depth of 4.9m alongside. A ro-ro ramp is situated at the N end. A privately maintained light is exhibited at each end of the berth.

**Tides—Currents.**—The tidal rise at Digby is 8.2m at MHWS, and 7.1m at MHWN.

In the Bay of Fundy, across the entrance to Digby Gut, the tidal currents run parallel to the shore, with a maximum velocity of about 2.5 knots, turning inshore a little before, and offshore a little after local HW and LW. The current runs NE with a rising tide and SW with a falling tide.

In Digby Gut, the currents have a maximum velocity of about 5 knots, turning approximately at local HW and LW. Both currents cause whirlpools and eddies, which are particularly strong on the W side of the channel, in the vicinity of Man of War Rock. Turners Eddy, over a shoal with a depth of 7.9m, lies about 0.7 mile SE of Prim Point.

A SW swell in the Bay of Fundy will propagate into Digby Gut; when combined with the ebb current, large waves will be encountered on the seaward side of Man of War Rock. This effect is reported to be at its greatest about 2 hours 30 minutes before LW.

**Pilotage.**—Pilotage is not compulsory. Local pilots for Digby and Annapolis River are available day and night, and should be applied for through the shipping agent or by radiotelephone to the Pilotage Commission at Digby.

Pilot usually meets vessels at the entrance to Digby. As long as a 12 hour notice is given, no waiting is experienced.

Annapolis Basin is occupied by extensive shoals with depths of less than 1.8m in the S part, and the inner or NE part is filled with shoals through which flows the channel of the Annapolis River. Port Wade, on the NW side of the basin, has a wharf in a state of disrepair near the village.

**1.74 Digby** (44°38'N., 65°46'W.) (World Port Index No. 6470) lies in the SW part of Annapolis Basin. The local industries are commercial fishing, lumbering, and farming. The main entrance channel has a width of 90m and a minimum depth of 6.1m. It is the high tidal range that permits the maximum allowable draft of 12.9m. The main public wharf has a length of 95m, allowing a maximum draft alongside of 12.9m. Ferry traffic is loaded and unloaded at the main wharf. The port consists of an F-shaped spur, but only the main stem is used for commercial traffic.

**Pilotage.**—Pilotage is not compulsory but available. VHF channel 16 is used.

**Anchorage.**—There is good anchorage for small vessels in depths of 11 to 14.6m, about 1 mile N of the wharves at Digby. There is anchorage nearer to the pier in a depth of 7.3m. Deep-draft vessels can anchor in depths of 16.5 to 18.3m in the central part of Annapolis Basin.

**1.75** The Annapolis River is navigable by vessels of moderate draft, with local knowledge, as far as Annapolis Royal, about 5 miles above **Goat Island** (44°42'N., 65°37'W.). The latter island, 7.6m high and wooded, lies nearly in the middle of the river entrance, and on the S side of the principal channel. An extensive shoal, which dries in places, extends nearly 4 miles SW from the island. The channel leading to the river entrance lies along the N side of this shoal, and is marked by buoys. Schafner Point, on the N side of the river entrance, is marked by a light.

**Annapolis Royal** (44°45'N., 65°31'W.) (World Port Index No. 6480) has several wharves which dry alongside at LW. A causeway and dam cross the river close above Annapolis Royal. The public wharf, which dries, is 117m long; vessels up to 110m long, with a maximum draft of 10.3m, can be accommodated. Vessels may anchor about 1 mile below the town in depths of about 11m; however, because of the tidal eddies, it is a poor anchorage.

**Caution.**—Changes in currents in the Annapolis River may occur without notice due to the operation of turbines and sluice gates at the hydroelectric power plant at Annapolis Royal. Off the power station, a current of up to 4 knots can be expected.

## Annapolis Basin to Minas Channel

**1.76** The coast from Digby Gut to **Chute Cove** (44°55'N., 65°21'W.), about 22 miles NE, is free of off-lying dangers. The ridge, separating the coast from the valley of the Annapolis River, rises to heights of 122 to 213m, and is partially covered with trees.

Parkers Cove, about 12.5 miles NE of Digby Gap, has an L-shaped wharf protected by two breakwaters. The E and larger of which is curved and 160m long. A light is shown from a framework tower, 7m high, from the head of the E breakwater. Two rocks, which dry, lie about 275m NW and 0.4 mile NE of the outer end of the E breakwater.

At Chute Cove, about 9.5 miles NE of Parkers Cove, there is a small boat harbor formed by breakwaters. Hampton Light is shown close E of the W breakwater. Small vessels can anchor in 8.2m, mud, about 0.4 mile NW of the light with offshore winds.

Tidal currents between Parkers Cove and Chute Cove, with a velocity of 1.75 to 2 knots, turn a little before local HW and LW. The current runs to the NE on the flood tide and to the SW on the ebb tide. In the offing, the tides turn about 30 minutes later.

Ste. Croix Bay, about 1.5 miles NE of Chute Cove, affords good anchorage in a depth of 7.3m, mud, about 0.5 mile NE of the W entrance point of the bay.

At Port Lorne, a small inlet about 4.5 miles NE of Chute Cove, there is a wharf, 131m long, extending to a depth of 5.5m at HW. A light is shown close E of the inlet. Anchorage can be taken in 11 to 12.8m, 0.25 to 0.5 mile N of the wharf.

**Port George** (45°00'N., 65°09'W.) lies about 6 miles NE of Port Lorne; drying ledges extend about 275m offshore. Anchorage can be taken in 9.1m, about 1 mile NE of Port George.

**Caution.**—A submarine telecommunications cable extends NW from the shore about 2 miles ENE from Port George to the NW shore of the Bay of Fundy. The cable lies about 0.5 mile NE of the suggested anchorage described above.

Margaretsville, one of the principal villages on the SE side of the Bay of Fundy, lies about 4.5 miles NE of Port George. There is a breakwater wharf, 70m long with depths of 3 to 4m along the outer 30m at HW. A light is shown from Margaretsville Point, close W of the village.

Margaretsville Bank, with a least depth of 0.3m, lies parallel to and about 0.5 mile from the shore; the shallowest spot lies about 0.8 mile NE of Margaretsville Point. Between the W extremity of the bank and the breakwater there is a channel with a depth of 5.5m. Vessels anchor between the bank and the shore in a depth of 10.1m, clay bottom.

**Morden** (45°06'N., 64°57'W.), about 6 miles NE of Margaretsville, can be recognized by its square church tower. There is a government wharf, 91m long, with a depth of 9.1m





**Margaretsville Light**

at the outer end at HW. A 6.4m patch, marked by a tide rip, lies about 0.8 mile NW of the church. Anchorage can be taken in 11m, about 1 mile NNE of the church.

A tower, marked by red aircraft obstruction lights, is conspicuous about 4 miles ESE of Morden. A high, steep, reddish cliff lies about 1 mile NE of Morden.

### Minas Channel

**1.77** Minas Channel, the approach to Minas Basin, is entered between Morden and **Cape Chignecto** (45°20'N., 64°57'W.), about 13.5 miles N. The latter cape is a steep-to,

bold, conspicuous headland. The land near the cape rises rapidly to over 213m.

**Ile Haute** (45°15'N., 65°00'W.), 97.5m high, lies about 5 miles SSW of Cape Chignecto. The island, marked by a light (framework tower, 12m high) on its highest point, is wooded and bordered by cliffs except at the E and W ends. The light may be obscured when the mariner is closer than 2.5 miles. Its shores are clear of dangers except at its E end, where a rocky spit extends 0.4 mile ENE. There are tide rips close N and S of the island. There is an anchorage in 21.9m, about 0.3 mile N of the E end of the island. A 23m depth has been reported in an area about 2 miles NNW of the light.

**1.78 North Shore.—Advocate Bay** (45°20'N., 64°47'W.), between Cape Chignecto and Cape D'Or, about 7.5 miles ESE, affords good anchorage in depths less than 28m with N winds, but vessels using it should exercise caution if the wind shifts to the S, when it frequently veers to the W and increases in force. Advocate Harbour, on the NE side of the bay, is muddy, dries, and is protected from the S by a natural wall of stones, 3m high. Near the E end of the wall, there is an entrance through which small vessels can enter at HW. A light (orange daymark, framework tower, 7m high) is shown from the S side of the entrance to the harbor. A lighted bell buoy is moored about 0.8 mile W of the light.

**Cape D'Or** (45°18'N., 64°46'W.), low and green, is the S extremity of a ridge, 152m high, separated from the promontory to the N by a deep valley. The W side of this ridge, N of the cape, is faced by cliffs, 61m high. A light is shown from a white square tower on the corner of a white square building on the cape. On the flood tidal current, there is a heavy tide rip close S of the cape.



**Cape D'Or Light**



**1.79 South Shore.**—The south shore Minas Channel, from Morden to **Shoal Point** (45°13'N., 64°35'W.), about 17 miles NE, is bordered by a shorebank, with depths of less than 5.5m, extending up to 0.5 mile offshore in places.

At Ogilvie, about 5 miles NE of Morden, there is a government wharf, 84m long, with a depth of 7m at the outer end at HW. A light is shown at the settlement of Harbourville, about 1.5 miles NE.

Black Rock, which dries 5.2m, lies about 2.5 miles ENE of Harbourville. A light is shown near the settlement of Black Rock, close S of the rock.

At Halls Harbor, marked by a light and lying about 6.5 miles ENE of Black Rock, there is a breakwater, 116m long, which dries at LW. There are depths of 4.6 to 5.5m alongside at the outer end at HW.

At Shoal Point, about 1.3 miles E, rocks extend about 0.3 mile N.

At Baxter Harbour, about 3 miles farther E, there is a government wharf, 72m long, with a depth of 7.9m at the outer end at HW. A conspicuous tower, at an elevation of 309m and marked by red aircraft obstruction lights, is situated about 5 miles ESE of Baxter Harbour.

Cape Split, the E entrance point of Minas Basin, lies about 6 miles NNE of Baxter Harbour. The intervening coast forms Scots Bay, which dries at its head. Cape Split is described in paragraph 1.81.

## Entrance to Minas Basin

**1.80** Minas Basin is entered between Cape Spencer and Cape Split, about 9 miles E.

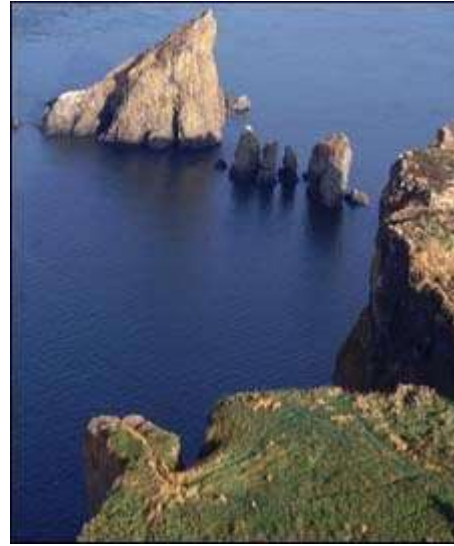
**Cape Spencer** (45°19'N., 64°42'W.), about 3.3 miles ENE of Cape D'Or, has a conspicuous sugar-loaf rock, 6.1m high, which is isolated from the remainder of the cape at HW. A drying rock lies about 90m E of the cape.

Spencer Island, 55m high and wooded, lies about 1 mile NE of Cape Spencer and is separated from the mainland by a passage with a depth of 1.8m. A settlement, known as Spencers Island, is situated on the mainland, about 1.5 miles NW of the island. There is an anchorage in 9.1m, about 0.8 mile N of the island.

**Cape Sharp** (45°22'N., 64°24'W.), about 7 miles ESE of Port Greville, is surmounted by a remarkable sharp hill, 116.7m high, from which its name is derived. Black Rock, 4.6m high, lies nearly 0.5 mile offshore, about 0.8 mile W of Cape Sharp. A light is shown from the cape.

**1.81 Cape Split** (45°20'N., 64°30'W.), on the S side of the entrance to Minas Basin, consists of cliffs, 61m high, divided by deep fissures or splits from which its name is derived, and is the termination of a remarkable, tapering promontory, 122m high. A spit, with depths of less than 9.1m, extends about 0.8 mile NW of the cape, with two drying rocks on it, about 0.2 mile and 0.3 mile, respectively, from the cape. During the strength of the tidal currents there is a heavy tide rip over, and a considerable distance NW, of the spit.

**Tides—Currents.**—The tidal currents along the coast between Chute Cove and Halls Harbor increase in velocity from 2 knots off the former to 3 knots off the latter. As Scots Bay is approached, the velocity of both currents decrease.



**Cape Split**

From near Cape Chignecto, the E current sets toward Cape D'Or, where it meets an eddy and causes a tide rip which extends about 1 mile S of the cape. With the W current there is an eddy W of the cape.

Around Cape D'Or and Cape Spencer the velocity of both currents is 5 to 6 knots; N of Cape Split, outside the tide rip, the velocity is 7 to 8 knots.

**Anchorage.**—In addition to the anchorages previously mentioned, vessels can anchor in about 21.9m, from 0.5 to 1 mile from the shore anywhere between Digby Gut and the mouth of Scots Bay. East of Morden, a strong W wind, lasting for more than 6 hours, causes a heavy sea with the first part of the E tidal current, and renders the anchorage bad, especially for small vessels. Strong SW winds make the anchorage uncomfortable for small vessels during the W current.

Vessels waiting for a favorable tide to enter Minas Basin can anchor in 9.1m, about 0.5 mile from the shore in Greville Bay, which lies between Spencer Island and Port Greville, or they can anchor in 18.3m, about 1 mile SE of Cape Split, but this anchorage is not recommended during the autumn months, when gales which commence from the E frequently shift to the W. A radar reflector is situated 3.5 miles ESE of Cape Split on the N side of Scots Bay.

## Minas Basin

**1.82** Minas Basin, with Cobequid Bay, its E extension, extends about 50 miles E of **Cape Split** (45°20'N., 64°30'W.). The basin has depths of 73m in its entrance and 18.3m in its central part. The estuary of Avon River, in the SW part of the basin, and Cobequid Bay, at its head, are encumbered by shoals and drying banks.

**Ice.**—Minas Basin and its approaches, E of Cape D'Or, are ice-covered in average years from about the end of December to the end of March, February being the worst month. The ice in the basin is mainly unnavigable in January and February.

**Tides—Currents.**—When navigating in Minas Basin, mariners must take into consideration the great rise and fall of the tide. The tidal rise at Parrsboro is 11.3 to 12.5m at neap tides, and 12.7 to 14.2m at spring tides. There is a least depth of approximately 6.7m in the middle of the entrance opposite the light on the breakwater at HWN.

The tidal currents in the middle of the entrance to Minas Basin, N of Cape Split, have a velocity of 7 to 8 knots. In the basin, the velocity is about 3 or 4 knots.

**Anchorage.**—In moderate weather, vessels can anchor anywhere along the shores of Minas Basin and Cobequid Bay, but off the N shore the bottom is hard. The great rise and fall of tide must be taken into consideration.

**Caution.**—The various shoals and banks in Minas Basin and Cobequid Bay are composed of loose shifting sand, and their positions can be altered by the strong tidal currents, gales, and the breaking up of the ice in the spring.

**1.83 Partridge Island** (45°22'N., 64°20'W.), on the N side of the entrance to the basin and about 2 miles E of Cape Sharp, is 81m high and an island only at HW. There are strong tide rips S and SE of the island. A local magnetic anomaly has been experienced in the vicinity of the island.

**West Bay** (45°22'N., 64°22'W.) is the W part of Parrsboro Roads, the large bay between Cape Sharp and Partridge Island. East Bay is the E part of the bay. Dickson Bar, nearly 1 mile WNW of Partridge Island, is a sandy shoal which dries at extreme LW; a detached shoal bank, with depths of less than 5.5m, extends about 0.8 mile W of Dickson Bar. A small detached shoal, with a least depth of 4m, lies between Dickson Bar and Partridge Island.

There is good anchorage, with local knowledge, in 8.2m in West Bay, about 0.4 mile and 0.8 mile NE of Cape Sharp, between the detached bank and the shore. There is good anchorage with local knowledge in East Bay in 7.6m, about 0.1 mile N of the shoal and 0.3 mile ESE of Dickson Bar.

**1.84 Parrsboro Harbor** (45°23'N., 64°19'W.) (World Port Index No. 6520), at the mouth of the Farrells River (Parrsboro River), is entered between Crane Point, about 0.8 mile NE of Partridge Island, and McLaughlin Bluff, about 1 mile farther ENE. Clarke Head rises to a height of 116m, about 2 miles E of McLaughlin Bluff. A conspicuous light gray cliff, 58m high, lies S of this headland. Lighthouse Bar, which is covered at extreme HW, and a breakwater extend about 0.5 mile NE from close N of Crane Point and shelter the harbor. Parrsboro Light is shown from the breakwater on the W side of the harbor entrance, about 0.1 mile S of the N extremity of Lighthouse Bar. The government wharf lies about 0.1 mile NNW of the N extremity of Lighthouse Bar. The navigation season is from April 1 to December 31. Lumber and pulpwood are exported.

**Depths—Limitations.**—Owing to the large range of tide, the harbor is accessible by vessels of moderate draft which are capable of taking bottom. In 1994, it was reported that drafts of 5.2m at neaps and 6.7m at springs can be safely carried. There is a least depth of approximately 6.7m in the middle of the entrance opposite the light on the breakwater at HWN.

The dog-legged public wharf, with a berthing length of 100m, has a vessel bed of hardwood 100m long and 16m wide alongside the wharf for ships to lie upon at LW.

**Pilotage.**—Pilotage is not compulsory. Local pilots are available and will board vessels off Ile Haute or Spencer Island, if arranged in advance. Entrance to the harbor should not be made without local knowledge.

**Anchorage.**—Off Parrsboro Lighthouse and at Parrsboro Roads, there is good anchorage in depths of 11m.

## North Side of Minas Basin

**1.85 Moose Island** (45°23'N., 64°05'W.), 106.7m high and thickly wooded, with steep earth cliffs on its S side, lies about 6.5 miles E of Clarke Head and exhibits a light on the E end.

The shore between East River and Economy Point, about 8 miles ESE, is composed of high red cliffs. **Brick Kiln** (45°21'N., 63°57'W.) an islet, 15.2m high, lies about 2.5 miles W of Economy Point. Brick Kiln Ledges, the W one of which dries about 3.7m, lie about 0.5 mile S and 0.8 mile SW of the islet. A lighted bell buoy is moored about 1.5 miles SSW of Brick Kiln.

On the W side of the mouth of the **Bass River** (45°24'N., 63°47'W.), about 5.5 miles ENE of Economy Point, there is a government wharf with a pier head, 58m in length, with a depth of 5.8m along the face at HW.

From the mouth of the Bass River, the N coast trends E for another 18 miles to where the Salmon River empties into the head of the basin. This part of Minas Basin, E of Economy Point, is known as Cobequid Bay. From the Portapique River, about 3 miles E of Bass River, the head of Cobequid Bay is obstructed by loose shifting sandbanks which dry.

## West and South Sides of Minas Basin

**1.86 Cape Blomidon** (45°18'N., 64°20'W.), about 7.5 miles ESE of Cape Split, is 174m high and steep-to. Pereau Creek empties into the basin about 4.5 miles S of Cape Blomidon. A conspicuous radio tower, at an elevation of 310m and marked with red aircraft obstruction lights, is situated about 0.8 mile NW of the mouth of the creek. At the mouth of Pereau Creek there is a wharf, 30m long, with a depth of 3m along the W side at HW.

The village of Kingsport lies about 0.5 mile SW of **Longspell Point** (45°10'N., 64°21'W.), on the N side of the entrance to Habitant Creek. The navigation season is from March 1 to January 15.

The government wharf at Kingsport is about 158m long, with a berth 126m long and a depth of 4.3 to 6.7m alongside at HW; the outer end of this wharf was damaged in a storm and is not useable. There is good anchorage in 9.1m, about 0.8 mile N of the island.

Cornwallis River is entered between Starrs Point, about 2 miles S of Kingsport, and Long Island Head. Wolfville, about 2 miles S of Starrs Point, has a small basin, but the wharves are in a state of disrepair.

**1.87 Port Williams** (45°05'N., 64°25'W.) (World Port Index No. 6485) lies on the N side of Cornwallis River, about 2 miles W of Wolfville. A public wharf, 82m long, which dries at LW, lies on the N side of the river just below the highway bridge. A vessel bed alongside the wharf is 102m long, 12.3m

wide, with a depth of about 8.5m at HW. A fertilizer plant is situated on the wharf. This wharf was closed to vessels because of the poor condition of the vessel bed. The navigation season is from April 1 to January 15. Pilotage is not compulsory; local pilots are available. The pilot will board at Cross Bar Shoal Light and bell buoy in Minas Basin, or late in the navigation season, off Digby.

## Avon River

**1.88** The Avon River is entered between **Horton Bluff** (45°07'N., 64°14'W.) and Indian Point, about 1.5 miles NE. Boot Island, 13.7m high, lies about 2.5 miles NW of Horton Bluff. The river bed dries about 5 miles above its mouth, but because of the large tides, amounting to over 12.8m at neaps, the river is navigable to Windsor, about 8 miles from the mouth. Only mariners with local knowledge should attempt to navigate the river. Hantsport is situated on the W bank of the river, about 3.3 miles upstream from Horton Bluff. The navigation season is from April 1 to December 31.

**Western Bar** (45°11'N., 64°15'W.), which dries about 5.2m, composed of shifting sand, lies on an extensive bank extending about 4 miles N from Boot Island. Middle Ground, which dries 6.7m, lies on the E side of the channel in the approaches to the river. Cross Bar, with a depth of less than 0.9m and composed of shifting sand, lies near the N end of Middle Ground.

**Aspect.**—A lighted bell buoy is moored about 4.5 miles N of Boot Island. Range lights are exhibited from Horton Bluff, on the W side of the Avon River.

**Anchorage.**—There is good anchorage for small vessels off the mouth of the Avon River in 8.2m, about 1.5 miles NNW of Horton Bluff. It was reported that anchorage can be obtained in about 12.8m, about 0.5 mile NE of Horton Bluff.

**Caution.**—Isolated depths as little as 2m exist close to the Horton Bluff leading line, which passes between Western Bar and Eastern Bar (Middle Ground).

**1.89 Hantsport** (45°04'N., 64°10'W.) is a tidal port. Vessels arrive and depart on a suitable tide; vessels usually arrive in the vicinity of Cross Bar Shoal 4 hours before HW. A vessel, with a draft of 9.8m, has used the port, although vessels are usually restricted to a maximum draft of 7.6m. Gypsum and pulp products are exported. Fertilizer is imported.

**Depths—Limitations.**—The public wharf is 137m long; a vessel bed alongside the wharf is 137m long, 18m wide, and dries 4.9m. A light is shown from a mast on the N end of the wharf. The plant of the Minas Basin Pulp and Power Company lies near the wharf.

Close N of the Public Wharf is the Fundy Gypsum Company Wharf, with a large, conspicuous gray warehouse. The wharf is 152m long and dries 4m alongside. There is no vessel bed at this wharf. Vessels dock 3 hours before HW and depart at HW on the same tide. The wharf is equipped with conveyors capable of loading about 20,000 tons of ore to a vessel during

the same time. Between the above two wharves, there is a small wharf used by small craft and tugs.

**Pilotage.**—Pilotage is not compulsory, but recommended for mariners without local knowledge. Pilots and tugs are available through the Fundy Gypsum Company. The company maintains a listening watch on VHF channel 7A. Vessels normally arrive in the vicinity of Cross Bar Shoal 4 hours before HW.

**1.90 Windsor** (45°00'N., 64°08'W.) (World Port Index No. 6500), on the Avon River about 5.5 miles further upstream from Hantsport, has a wharf operated by a fertilizer company situated on the St. Croix River near the town. This wharf has a berthing length of 91.3m, with a depth alongside of 6.4 to 7.6m at HW.

**1.91 Walton Harbor** (45°14'N., 64°01'W.) (World Port Index No. 6510), in the mouth of the Walton River, about 11 miles NE of the entrance to Avon River, is a tidal harbor which dries at LW. A tower, 62.5m high, is conspicuous in the village of Walton on the E side of the harbor. An abandoned light tower is situated on the E side of the entrance to the river. The harbor is open from April 1 to December 1.

The government wharf has a berthing length of 107m, and a depth of 4.6 to 7.3m alongside at HW. The ruins of a gypsum wharf, 84m long, extend from the public wharf and are reported to cover at HW.

Anchorage can be taken in about 12.8m, 3 miles NW of the abandoned light.

The Hogsback, a sandbank about 1.8 miles long in an E-W direction, the central part of which dries, lies about 2 miles offshore between the mouths of the Avon and Walton Rivers. Depths of less than 5.5m cover this narrow sandbank.

**1.92 Cape Tenny** (45°17'N., 63°53'W.), about 6 miles NE of Walton Harbor, is the W entrance point of Cape Tenny River. A wharf, on the W side of the river entrance, is 82.3m long, with a pierhead 42.7m in length. There is a depth of 5.5 to 6.1m along the face at HW.

**Burntcoat Head** (45°19'N., 63°49'W.), 33.5m high and prominently red, lies about 3.5 miles farther NE from Cape Tenny. In the vicinity of Burntcoat Head, the tide rises 13.5m at neaps to 15.5m at spring tides.

Lower Selma, about 10 miles E of Burntcoat Head, has a public wharf, 69m long and 6.1m wide, with depths of 1.2 to 2.1m at the outer end at HW. A rock construction extends 50m from the end of the pier.

**Salter Head** (45°20'N., 63°32'W.), 14m high, is the W entrance point of the Shubenacadie River. The village of Maitland, about 2 miles SE of Salter Head, has a government wharf, with a depth of 6.7m at HW alongside its outer face, which is 17.8m long. The Shubenacadie River is navigable by boats at LW for about 13 miles to within 2 miles of the town of Shubenacadie.